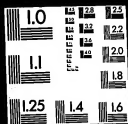


1 2 3 4 5 6 7 8 9 10 11 12
CENTIMETERS



14:1

Thomas A. Edison Papers

A SELECTIVE MICROFILM EDITION

PART V (1911-1919)

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**Thomas A. Edison Papers
at
Rutgers, The State University of New Jersey
endorsed by
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18 June 1981**

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START

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A Note on the Sources

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filmed are the best copies
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**NOTEBOOK SERIES
NOTEBOOKS BY EDISON
AND OTHER EXPERIMENTERS**

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books**

These thirteen notebooks were used by E. Rowland Dawson, Clarence B. Hayes, William A. Hayes, Absalom M. Kennedy, Frank H. Losey, Walter H. Miller, George J. Werner, and others during the period 1915-1924 for notes on experimental recordings. The selected books primarily cover the period May 1915-August 1917, but there are also some entries from 1918-1921. Many of the experiments involve the use of various types of recorders and horns—as well as variations in the positions of horns, recording machines, instruments, and voices—in order to determine the optimum volume and quality of sound. Several books include maps and drawings to indicate the positions, as well as extensive information on the various horns used in the experiments. Some of the recording work was done at the Columbia Street Studio, where cylinders were dubbed or transferred from disc records and experimental work was carried out for long-playing and slow-speed recordings. Many of the Columbia Street recordings were intended for background music and sound effects for motion pictures. Some of the experimental work on cylinder-to-disc dubbings included attempts to re-record selections by artists that were no longer under contract with Edison. Considerable experimental work was also done on acoustical recording, with instruments in various positions and distances and with the use of long acoustical recording horns.

The eight notebooks containing substantial Edison comments or references to his work have been selected.

N-Number

Selected Books

15-05-04

15-08-02.1
15-11-19
16-07-03.2

16-11-13
20-00-00.3
17-01-06
19-01-10.2

Labels and Inscriptions on Front Cover

[additional information supplied by the editors appears in brackets]

"I-C-S Lessons. Experiments on Duplication. Also Disc Masters Made in Studio on London Mach. [G] J Werner - Alden St. Studio, W. Orange N.J."
"Record of Recorders"
"Mr Edison"
"Record of Recorders For Columbia St. Studio. G.J. Werner"
[obscured by tape]
"Mr. Edison Notes - Columbia St. Studio"
"Notes, Columbia St. Studio from Jan. 6, 1917"

Books Not Selected

15-10-20

"Columbia St. Studio Experiments F. Losey G.
Werner G. Burt. 1920"

16-01-11

"Record of Positions"

16-05-31

"Horn Experiments"

16-06-01.2

—

16-12-01.2

"Recorders used with long horn in Columbia St.
Studio, Dec. 1, 1916"

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-15-05-04**

This notebook was used by George J. Werner during May 1915-August 1917. One additional entry is stamped "Dec 13 1920." At the beginning of the book are lists of experimental recordings and kinetophone films made at the Alden Street Studio in West Orange, along with data about commercial stock on hand at the studio. Subsequent entries pertain to a series of duplication experiments, some described as "for T.A.E.," with various combinations of diaphragms, speakers, and horns. These include disc-to-disc, kineto-to-disc, cylinder-to-disc, disc-to-cylinder, and cylinder-to-cylinder. Also included are notes on a series of "surface scratch" and "long distance" recording experiments performed for Edison in 1917. Some of the long-distance experiments involved the recording of various sounds in and near the laboratory yard, possibly for use as motion picture sound effects. Other entries describe an experiment for William F. Nehr that varied the speed of the recording machine; an experiment in which a dictating machine was used to record telephone calls; and a series of experimental cylinder recordings prepared for the DeForest Radio Telephone & Telegraph Co. Entries from June 1915 list all disc masters made in the studio on the "London Machine," including one recorded for Mina Miller Edison. Also included are lists of master recordings made for language lessons, with notations regarding which reproducer horn, recorder horn, recorder, and speaker were used. Two notes by Edison, one to Werner and the other to Charles T. Dally, are pasted into the book. The names and addresses of several recording artists appear at the end of the book. The front cover is labeled "I-C-S Lessons. Experiments on Duplication. Also Disc Masters Made in Studio on London Mach. [G] J Werner - Alden St. Studio, W. Orange N.J." The pages are unnumbered. Approximately 50 pages have been used.

59890

Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Definitions of abbreviations

- R - Record
- R* - Double Amplified Record
- F - Film
- K - Kitchen
- U - Upstairs in Dressing Room

Russian.

- 132A-R101 Krupny Long. F & R. U.
 133A-R102 Russian Culture. " " "
 134A-R103 Concert #2. " " "
 135A-R104 Musical Clavier (1st Edition) " " "
 136A-R105 Russian Long & Dance. " K
 145B-R107 Gzae Lector Ivanovitch. " U.
 152B-R109. Comit of Luxemburg. n. Grand U. K
 153B-R110. Song of the Sick Child. " K
 154A-R111 - The Uctal of Fire. " U.
 170A-R112 Most from the Opera the Jewess. " U.
 171B-R113 Aria of Elazar from the Jewess. " "
 172A-R114 Operetta Nella Citta. " "
 173A-R115 On the Dance of Passion. " "
 175B-R116 Bashma Hungarian Dances. K
 176A-R117 Masopust. " U.
 177A-R118 Field of Bonwill. " K
 178A-R119 Musical Clavier. " U.
 179B-R120 L. Krzyz, Story teller. " "
 182B-R121 Costa Colomendi. " "
 183B-R122 The Dog Tax. " "
 184B-R123 Songy Operetta. " "
 185B-R124 Scenes of Krupny Life. Part I. " "
 186A-R125 " " " Part II. " "

197 B-R 126 Concerto No. 10 Polka No. 3 R. U.
 198 B-R 127 Concerto No. 10 Polka No. 3 R. U.
 199 B-R 128 Concerto No. 10 Polka No. 3 R. U.
 200 B-R 129 Workingman's Song. " " "
 201 B-R 130 The Hussars " " "
 202 B-R 131 I have but what I deserve " " "
 203 B-R 132 Home in the garden. " " "
 204 B-R 133 A May night. " " "
 205 B-R 134 Earth's Promise. " " "
 144 A-R 108 Crime & Punishment " " "
 209 A-R 135 The Pitter Mouse " " "
 210 A-R 136 The Pitter Mouse " " "
 211 B-R 138 The Pitter Mouse " " "
 212 B-R 139 The Pitter Mouse " " "
 213 B-R 140 By a Dark Night " " "
 214 B-R 141 Attack of the Doctors " " "
 215 A-R 142 Carmen, Gypsy song " " "
 220 A-R 143 Appearance of Jorador " " "
 221 B-R 137 The Pitter Mouse " " "
 222 A-R 144 Garden in Moonlight " " "
 223 A-R 145 Carmen, Final Scene " " "
 242 B-R 149 Life Guardsman Pt. 1 " " "
 243 B-R 150 " " " 2 " " "
 244 B-R 151 " " " 3 film " " "
 245 B-R 146 Life for the Gypsy " " "
 246 B-R 147 Allah Verdi & Days of our life " " "

234 B-R 148 Roumanian Song & Homage to P. R. U.
 237 A-R 152 Gypsy Quett from Night Xpress " " "
 238 B-R 153 Concerto by M. Davidoff " " "
 239 B-R 154 " " " " " "
 240 A-R 155 Quett from Vivaldi of Cine " " "
 241 B-R 156 Trio " Night Xpress " " "

Experiments #20.

2 samples on record.

Just. 1420 (with carriage)

Secnd 1470 (without carriage.)

Porcupine Reg - Band.

Austrian, Italian, French, Swedish + Others.

918.	Das Rote Herz.	F. R. U
941.	La Bonne Nuit Blanche.	" " "
952.	Hochstapler Einbrecher.	" " "
992.	Limpide Vagabundus. 2 Parts.	" " "
1002.	Les Jours Quatre-vingt-trois.	" " "
1082.	Der Schindlerische Hebräer.	" " "
1092.	Opfer der Felle.	" " "
1102.	Wacanten Vor Parre.	" " "
1152.	Fant.	" " "
1152B.	Fant.	F R K
1272.	Heimat.	" K
1382.	Das Kesselspiel.	" " U.
1418.	Frühe Polly + Inal Mädel.	" " "
1562.	Kriegsruß.	F R K
1592.	Wasserscheit - 3 Parts.	" " "
1572.	Abchied Landschützen.	" " U.
1587B.	Anda	" " K
1597B.	Piccolillo <small>a. Rund 16</small>	" " K
1602.	Hugon.	" " K
1612.	Fant.	" " K
1622.	Carollina Fantasma.	" " K
1632.	El Tratoro, La Tira.	" " K
1642.	Samson + Dabla.	" " K
1652.	Carman.	" " K
1662.	Luca de Sammarconi.	" " K

167b. La Bohème.	K	F	R
168b. L'Avant-scène (Final Scene)	K		
169a. Mame's L'Amour - 2 Parts.	K	"	"
174d. Die Puppe, 3 Parts.	K	"	"
180b. Les Pigeons.	K	"	"
181c. Cinq Larmes.	U	"	"
182b. Brage. Brage, Bragejane.	K	"	"
184d. Patti L'Amour.	U	"	"
189d. J'embrasse le Gros Bicyclette.	K	"	"
106b. Die Geister	K	"	"
138a. Das Riesenkind	U	"	"
89a. "1813"	"	"	"
96b. Tales of Hoffmann	"	"	"
101a. Das kleine Hühnerchen	"	"	"
107a. Baron Munchausen	"	"	"
108a. Brage und Antwort	"	"	"
114a. Les de la vie Paris	"	"	"
112a. Die Fledermaus 3 pts	"	"	"
111a. Wenn Weib und Braut	"	"	"
118a. Swedish L'Amour	"	"	"
126a. Les de la vie Paris	"	"	"
143b. Der Hühnerchen	"	"	"
144a. Die Vorträge	"	"	"
145a. Moll. Moll an die Treue.	"	"	"
146a. Fasset a Lust Soldat zu sein.	"	"	"
189b. Magyar Compagnie (Hühnerchen, L'Amour)	"	"	"

151a. Kinder im Walde	U.	R.
201b. Das Ganze Einzel songs	"	"
185. Gerettet 2 parts	"	"
202b. Moll. Moll an die Treue. Songs	"	"
235a. Moll. Moll an die Treue. Songs	"	"
236a. Moll. Moll an die Treue. Songs	"	"
218b. Moll. Moll an die Treue. Songs	"	"
208b. Moll. Moll an die Treue. Songs	"	"
212b. Moll. Moll an die Treue. Songs	"	"
214b. Moll. Moll an die Treue. Songs	"	"

Test, and Experimental subjects
made at Alden St. Studio.

Mr. Head - test for side lighting	F.	U. K
K4 New Head Lett + Doyle (test)	F.	U. K
Doyle, Bush, + Lett (light test)	F.	U. K
Lett with white hat (side light test)	F.	U. K
Lett - large head focus test & sync. Camera	F. U. K	
Lett - seated - stereoscopic test	F. U. K	
Mr. Huteliger + A. M. H. Buddin + Bear	F. U. K	
Stamm + Doyle (steel gate test)	F. U. K	
Test of "Dining Room Set"	F. U. K	
Mr. Tuttle + Maxwell	F. U. K	
Crystal Lake test	F. U. K	
Price of negative of Huteliger's firework	F. K	
Negative of Humphreys double exposure	F. U. K	
2 Camera Clarence test of Choo Ch.	F. K.	
Bob Lett Monologues Good Bye Bye	R ⁺ F. K.	
K7X Mr. Brooks + Young lady	R ⁺ F. U. K	
M.R. H. + Party talker in Bronx	R ⁺ F. K.	
Lesson in Photography since 1833	R ⁺ F. K.	
K5 On the Way to Mexico	F. U. K	
M.R. H. Portrait	R ⁺ F. K.	
Bob Lett + Pirates and boys	F. U. K	
K12 " in Come back to Chin	F. K.	
K11 Lett, Doyle (Hutcher) etc make up test	F. U. K	
K11D Final Exposure	R ⁺ F. K.	

Lecture by Humphreys (lyd test) F. U. ~~U~~
 K-10 Mrs Clark & Pett dancing R + F X
 Pett, Kennedy, Amwoodie & Head (test) F. U. ~~U~~
 K-9 Mrs Clark singing R + F X
 K-7A Portrait of Two Brooks alone R + F U. ~~U~~
 K3 Portrait of Bob Pett. R + F ~~U~~ X
 K-8 Maywell Party (demonstration) R + F X
 140 Violin Solo R X
 Band selections (direct one) R X
 Experimental Record Amp. track U.
 Camera Stereo test F X

Regular Commercial Subjects
produced in Alden St. Studio

250a+b Portuguese Lecture H. R. H.
231a.B+b Janet " " "

Regular American Stock on hand

Frank B. Record & John	£	11.
Murray Savarino A.	£	11.
Heathcote & Co. B.	£	11.

5/4/5.
 DUPLICATING
 EXPERIMENTS & DATA.

COMBINATION FOR FULL TONE RECORD OF
 *3695-c-1 "Audible Chicken Dinner" by Collin & Har-

lan. — DISC HORN NO. 13.
 RECORDING NO. 3 B. } THIS SEEMS TO BE O.K.
 SPEAKER NO. 3. }
 DIAPHRAGM NO. 2. }
 LONG TUBE USED, WITH ALL HOLES OPEN IN 3 B. HORN.

GOOD COMBINATION FOR "KIPPLING WATER" BAND.

*2509-c — DISC HORN NO. 13.
 RECORDING MACHINE 3 B. } THIS SEEMS O.K. L.W.
 DIAPHRAGM NO. 2. }
 SPEAKER NO. 1. }
 LONG TUBE USED. ALL HOLES OPEN IN THE HORN 3 B.

DISC TO DISC DUPLICATION.

IN WAX IT SOUND VERY GOOD WITH THIS
 COMBINATION.

HORN NO. 3 ON REPRODUCING MACHINE
 HORN NO. 7 ON RECORDING MACHINE
 SPEAKER NO. 2. WITH 37/1000 BALL IN IT.
 RECORDER NO. 73. A4 MAX.

JAN. 5, 1916.

Speed Experiment for Rehe.

1st. Recording Machine running 160 R.P.M.
Disc. Mach. 80 R.P.M.

2nd Recording Machine 145 R.P.M.
Disc Mach. - 80 R.P.M.

Srl. Betty Murray.
Jap. Horn floating down the old
Green River.

Recorder used. #1.
Disc Speaker used #6.
Recording Mach. Horn 7 $\frac{1}{2}$
Disc Horn - 3.

Best results on disc sub. were:

1 2 3 4 5 6 7 8 9 0
1 2 1 2 3 2 1 1 3 ✓ Best.

on the letters - R. T. M. H.
3 3 1 1 Best.

3/24/16

Western Electric Phone Call Records.

Spec. No. 1. Phone Call #7 & H.
2 M. Recorder #7. Miller Right Weight
disc speaker.

Spec. No. 2. Phone Call #1
(Same as above.)

Spec. No. 3. Phone Call #7.
(Same as above.)

Above masters 80 rev. per min. made
on Commercial Dictating Machine
synchronized by geared rod with
disc machine.

(Paint with Light Pearl)

DEC 13 1920

SERIAL NO. 14970 -

200 THREAD PER INCH
140 REVOLUTIONS PER MINUTE.

SHOP CRUISE NO. 10,007. I33267

LABEL:-

SAN FRANCISCO LIGHT VESSEL #70. -

(WORDING)

"SAN FRANCISCO LIGHT VESSEL NO. 70" (LOD)

(REPEAT 3 TIMES - MAXIMUM SIGNAL STRENGTH)

"YOU ARE GETTING CLOSER"

($\frac{1}{2}$ LOD)

($\frac{1}{2}$ MAXIMUM - SIGNAL STRENGTH)

"YOU ARE VERY CLOSE" KEEP OFF"

(MINIMUM SIGNAL STRENGTH)

(NET)

MORLEY D.W. MEERER

RECORDED NO. 224

DISTANCE FROM 7'-24'-24"

MASTERS - 51-52-53-54

(7 Lines through
on splines)

NUMBERS H.M.R.T. MASTER BLANKS USED - 12 -

" MASTERS WHOLE - 51-52-53-54

UNDER DIRECTION OF MR. FRIEND, INSPECTOR OF ENGINEERING

NATIONAL B.S.M.

NEW YORK, BROOKLYN, N.Y.

W.B. CONNOR,

RADIO LABORATORY, B.S.M.

NAVY YARD, BROOKLYN, N.Y.

C93

OCT 12, 1915.

EXPERIMENT 8F.

DUPLICATING FROM KINETO TO DISC.

COLLEGE DAYS - TO - DISC.

LONDON DISC MACHINE USED.

RECORDER - NO. 73.

KINETO HORN - 3A.

DISC HORN - 7C

MADE SAME WAY AS ABOVE. ND
ONLY WEAKER. COTTON IN SPEAKER.

C95

AUG 30 1917

EXPERIMENTAL H.M. CYL. RECORDER
FOR DE FOREST RADIO TELEPHONE

& TELEGRAPH CO.

1391 SEDGWICK AVENUE.

REQUISITION S.O. 5011

SPEC. SHCP ORDER NO. 8133-

LABEL - D.F.W. POINT TWENTY LIGHT { D.
E.

MASTER NO. D.

MADE BY EDN. W. MEERER

DIRECT RECORDED.

RECORDER NO. A1

HORN 3A, VELVET EDGE.

DISTANCE FROM HORN { D-5"
E-

H.M. FEED. - 140 R.P.M.

WINDING - P.T.L-5sec. - P.T.L-5sec - P.T.L-

2sec. - YOU ARE GETTING CLOSER - KEEP OFF - 2sec -

(4 REPEAT.)

MASTER E

SAME AS D.

CYL. SERIAL NO. 13769-

1 known to me as such.

2 master blanks.

MAY 12 1917

EXPERIMENTAL 4M. RECORDED CYL.
FOR DE FOREST RADIO TELEPHONE

TELEGRAPH CO.

1341 SEDGWICK AVENUE,

NEW YORK, N. Y.

REQUISITION S. O. 5011,

SPECIAL INQ. ORDER NO. 8125

MASTER NO. A.

MADE BY EDW. W. MEEKER,

DIRECT RECORDED.

RECORDER NO. A1

HORN 3 A, VELVET EDGE.

DISTANCE MEEKER FROM HORN 3-4"

4 M. FEED. SPEED 140 RPM.

WORDING ON RECORD: "POINT JUDITH LIGHT,

(3 TIMES) - YOU ARE GETTING

REPEATED
25 TIMES

CLOSER, KEEP OFF" (ONCE)

MASTER NO. B

REPEATED
24 TIMES

SAME AS A. ONLY ~~SMALL~~
LITTLE LOADER.

MASTER NO. C

REPEATED
26 TIMES

SAME AS A
VOLUME BETWEEN A+B.

CYL. SERIAL NO. 13620.

MAY 17 1917

EXPERIMENTAL 4M. RECORDED CYL.
FOR DE FOREST RADIO TELEPHONE

TELEGRAPH CO.

1341 SEDGWICK AVENUE,

NEW YORK, N. Y.

TREMENT 4052

REQUISITION
MASTER NO. 1. 3.0.

MADE BY ED. MEEKER, 5011.

DIRECT RECORDED. SPECIAL SHIP ORDER

RECORDER NO. A1 8108.

HORN 3 A, VELVET EDGE,

DISTANCE MEEKER FROM HORN 5 1/2"

4 M. FEED. 160 SPEED.

WORDING ON RECORD: "POINT JUDITH

LIGHT, THREE TIMES,

THEN "YOU ARE GETTING CLOSER, KEEP OFF."

REPEATED 19 TIMES, 10 SECONDS MINT.

MASTER NO. 2.

SHADE WEAKER THAN NO. 1, OTHERWISE
ENTIRELY THE SAME. (REPEATED 18 TIMES)

MASTER NO. 3.

SAME CONDITIONS AS NO. 1, ONLY
MUCH SLOWER AND EMPHATICALLY SPOKEN.

(REPEATED 12 TIMES)

CYL. SERIAL NO. 13544.

6990

HERBERT FRYER'S
Selections tried. JUNE 15, 1915.

HUNTING SONG. 1 2 MASTER OF
THIS.

ROMANCE IN F# 2
SCHUMANN - OP. 28.

CHOPINS FUNERAL MARCH. 3

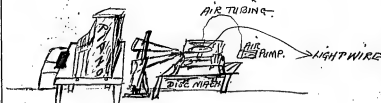
(G. Schirmer Publisher.)

L100

DISC MASTERS MADE
IN STUDIO ON LONDON MACHINE
SINCE JUNE 1, 1915. ALL PREVIOUS
RECORDS WILL BE FOUND IN BACK OF
CYLINDER BOOK #2 & 3.

JUNE 15, 1915.

DISC RECORD FOR MRS. EDISON.
PIANO. UPRIGHT, MASON & HAMLIN.
DELIVERED TO STUDIO JUNE 12, 1915. P.M.
TRAIL OF HERBERT FRYER.
PHONG LL6 OYAN, K.T.



PIANO STAND 30" FROM FLOOR TO BASE
DISC MACHINE 30" FROM FLOOR TO TABLE
& HORNS USED. NOS. 3 + 7.

RECORDER - 9 - REGULT.

NO. MASTERS MADE - 1.

DELIVERED TO C.D. HAYES FOR PLATING - 6 - 15.

DISTANCE FROM BACK OF PIANO TO EDGE OF
RECORDING HORNS - 22 1/2".

DISTANCE FROM FLOOR TO EDGE OF HORN - 48 1/2".

Mar 4th 1913

In C-S Lesson #1 & 2 Trunk

Master #1

Speaker Model C-2 M. Repro. H. #3

Repro. #48

Repro. #7^a

Without slide

Master #2

Speaker Same as above

Repro. H. #3

Repro. #48

Repro. H. #7^a

With slide open 1st notch

Trunk Lessons #3 and #4

Special #1

Speaker Model C-2 M.

Repro. H. #3

Repro. #48

Repro. H. #7^a

Slide on but closed

Special #2

Same as #1 only slide open
to the 1st notch.

Apr 5th 1915

I-C-S - Spanish Lessons #1 - #2
Special #1
Speaker - Model C-2M. Reps H. 3 R. H. 7^o
Insert - Limit - no slide Record #5

Special #2
Speaker - same as #1 Reps H. 3 R. H. 7^o
Insert - same as #1 Record #5

I-C-S - Spanish Lessons 3 & 4
Special #1
Speaker - Model C-2M. Reps H. 3 R. H. 7^o
Insert - Limit - no slide Record #5
(Switched end of Lesson #3)

Special #2
Same as #1

Apr 5th 1915

I-C-S. Spanish Lessons #5 - #6
Special #1
Speaker - Model C-2M. Reps H. 3 R. H. 7^o
Insert - Limit - no slide Record #5

Special #2
Same as #1

Spanish Lessons #7 and #8
Special #1
Speaker - Model C-2M. Reps H. 3 R. H. 7^o
Insert - Limit - no slide Record #5

Special #2
Same as #1

Spanish Lessons #9 - #10
Special #1
Speaker - Model C-2M. Reps H. 3 R. H. 7^o
Insert - Limit - no slide Record #5

Special #2
Same as #1

Nov 6-1915

I-C-S. Spanish Lessons 11-12
Speaker Model C-2M Rpts. H. 3. R. #17.
Insert - all of no slide Rnded. 4k

Special #2 same as #1

I-C-S. Spanish Lessons 13-14
Special #1 Same as above
" #2 " " "

I-C-S. Spanish Lessons 15-16
Special #1 Same as above
" #2 " " "

Nov 6-1915
I-C-S. Spanish Lessons 17-18
Same as above Special #1
" " " " #2

Lessons 19-20

Special #1 Same as above
" #2 " " "

Lessons 21-22

Special #1 Same as above
" #2 " " "

Lessons 23-24 Special 1-2 Same as above
" 25 " 1-2 " "

Nov 9-1915

I-C-S. French Lessons 5-6
Specials #1 and 2 same as Spanish.

I-C-S. French Lessons 7-8
Specials #1-2 same as above.

I-C-S. French Lessons 9-10
Specials #1-2 same as above.

I-C-S. French Lessons 11-12
Special #1-2 same as above only
Rpts. machine slowed down on
#12 to 14. words only 10 seconds
as original 2 min. set. was taken
at slow speed.

I-C-S. French Lessons 13-14
Specials 1-2 same as 9-10

I-C-S. French Readers 1-2
Specials 1-2. owing to machine
sounding slow and fast we were
compelled to slow up on Reader #1
and speed up on Reader #2, but
only a trifle, in both cases.

(10)

Nov 9th 1915

I. C. S. French Lesson # 30
~~Special #1 made with same length
50 as previous lesson but making
making run slower #2 made
at 90 revolutions~~ (Nov 10th 1915)

I. C. S. French Lesson # 15 Special 1-2
Made same as 9-10.

I. C. S. French Lesson # 16-17-18-19 Special 1-2
Made same as above.

I. C. S. French Lesson # 20-21-22-23 Special 1-2
Made same as above.

I. C. S. French Lesson # 24-25-26-27 Special 1-2
Made same as above.

I. C. S. French Lesson # 28-29-30 Special 1-2
Made same as above.
#30 speeded down as it originally was
made very fast.

11-15-15

I.C.S. German Lessons 1-2

Spinals 1-2

Speaker Model C 2 M. Rfid. H #3 R. H. 7a

Invert. - Lumb. Rinder 48

#2 Lesson had sound like me walking in my

I.C.S. German Lessons 3-4

Spinals - 1-2 - same as me.

I.C.S. German Lessons 5-6

Spinals 1-2 - same as me

11-16-15

I.C.S. German Lessons 7-8

Spinals 1-2 made same as above

Small knots in Lesson #7 made

I.C.S. German Lessons 9-10

Spinal - 1 -

Mastin of #9 developed defect
which made microscope look like
many chips and caused repeat
for this reason we could make
but not Mastin

I.C.S. Spanish Lessons 5-6

Spinals 1-2. Made same as me

4113

11-16-15

I-C-S German Lessons 11-12
Specials #1-#2 Made same as 9-10

I-C-S German Lessons 13-14
Specials #1-#2 Same as 11-12

I-C-S German Lessons 15-16
Specials #1-2 Same as 11-12

^c 11-17-15
I-C-S German Lessons 17-18-19-20
Specials 1st-2nd Same as 11-12

I-C-S German Lessons 21-22-23-24
Specials #1-#2 Same as 11-12

I-C-S German Lessons 25-26-27-28
Specials #1-#2 Same as 11-12

I-C-S German Lessons 29-30
Specials #1-2 Same as 11-12

I-C-S German Reader 1-2
Specials 1-2 Same as 11-12

Reader #1 Mother has *Imagin* in
sounds, as though *Imagin* had
been holding conversation in reading room

11-23-18

I-C-S English Lessons 3-4
Spirals 1-2 Same as above

I-C-S English Lessons 5-6
Spirals 1-2 Same as above

I-C-S English Lessons 7-8
Spirals 1-2 Same as above

I-C-S English Lessons 9-10

" " " 11-12

" " " 13-14

" " " 15-16

Made same as above Spirals 1-2

11-24-18

I-C-S English Lessons 17-18

" " " 19-20-21-22

" " " 23-24-25-26

" " " 27-28

" " " 29-30-31

Spirals 1-2 Same as above

Q-C.S.

11-29-15

Italian Lessons

#1-2	<i>Specials</i>	1-2
Had same as other language		
#3-4	<i>Specials</i>	1-2
#5-6	"	1-2
7-8	"	1-2
9-10	"	1-2
		11-29-15
11-12	<i>Specials</i>	1-2
13-14	"	1-2
15	"	1-2

Oct. 9, 1916.

*Lummi's Kinetophone Record for
Commercial Show.*

Made in New St. Studio 11/10 P.M.
by Harry C. Humphrey
Music drawn by Rust recording.
3 masters made A. B. & C.

C held for extra (mistakes in it)
A+B delivered to A. Wirth's Dept. 11/11 P.M.

Diaphragm C used.
Horn B (Det. & Rem.) used.
C Jumbo Blanks used.

Used master with sapphire ball.
B louder than A.

Ship order for about 8064 Special
Time is charged - 1 1/2 days from start.

NO. 1 EXPERIMENT

SEPT. 18, 1916

DUBBING FROM CYL TO CYL.
FROM MASTER MADE BY KENNEDY.
BLUE SUB.

LABELED - EX 1 T. 61-27 77
HORNS 13+20
REG. B. A. SPEAKER.
1ST. TRAIL RECORDER Q. 1.
2nd. " " 77

NOV. 29, 1916

EXPERIMENT NO. 1 FOR T. A. E.
FROM CEL. SUB. TO DISC WAX.
CEL. SUB. NO. 5150-C-1
HONOLULU, AMERICA LOVES YOU. A. FIELDS.
HORNS 13+14
RECORDER - 73
SPEAKER NO. 1
INSERT. - LIMIT.
ELBOW. - NO. 3

EXPERIMENT NO. 2. FOR T. A. E.
FROM CEL. SUB. TO DISC WAX.
CEL. SUB. NO. 4992-B-6
GARDEN DANCE, MARIMBA BAND.
HORNS - 13+14
RECORDER NO. 73.
SPEAKER NO. 1
ELBOW NO. 3
INSERT OUT ABOUT 2 INCHES

DEC. 8, 1916

EXPERIMENT NO. 3 FURT. D.E.

FROM CEL. SUB. TO DISC WAX.

CEL. SUBS. NOS. 5059A1 + 5017C2

HORNS 13 + 18

RECORDER NO. 20

SPEAKER NO. 1

ELBOW NO. 1

INSERT. 1ST X ON LOW & DOUBLE NOTES
OUT A LITTLE ON ALL.

2nd. LIMIT UNTIL FEMALE VOICE
THEN X —

EXPERIMENT NO. 4 FURT. D.E.

FROM CEL. SUB. TO DISC WAX

CEL. SUBS. NOS. 5059A1 + 5017C2

HORNS 13 + 18

RECORDER NO. 4.

SPEAKER NO. 1

ELBOW NO. 1

INSERT - SAME AS IN NO. 3.

FEB. 12, 1916

EXPERIMENT FOR W.H. MILLER.

DUB. FROM CYLINDER TO DISC.

CLY. RECORD OF MME. BERNHARDT. *35007-1

"L'AIGLON" LA PLAINE DE WAGRAM ..

HORNS 13 CIL. 20 DISC.

RECORDER NO. 4.

TO RUE AM. SPEAKER NO. A 11776.

INSERT - LIMIT.

DISC MASTER DELIVERED TO MR. MASS
7/4/17 AM.

SURFACE SCRATCH
RECORDING FOR T.A.E.

MAR 9-1917

DARK WAX NO. 1

DISC:- SURFACE EXPERIMENT #4587A
COMMERCIAL PRINT.

SPEAKER #5 - 80 R.P.M. H. 13

CYLINDER:- DARK WAX BLANK (E)

2 M. FEED.

40/1000 STYLUS, H-18

RECORDED #2

160 R.P.M., DIAMETER OF DARK WAX 2 5/32"

MAR 9-1917

LIGHT WAX NO. 2

DISC:- SURFACE EXPERIMENT #4587A
COMMERCIAL PRINT.

SPEAKER #5 - 80 R.P.M. H. 13

CYLINDER:- LIGHT WAX 47A, BLANK (E)

2 M. FEED. 40/1000 STYLUS

RECORDED #2

DIAMETER OF LIGHT WAX 2 5/32"

160 R.P.M. H. 18

(115)

MAR 10 1917

LIGHT WAX NO. 3

SAME AS #2 EXCEPT USED
RECORDER #1A. $\frac{1}{1000}$ STYLUS
THIS ONE GRAPHTED BY WURTH
TO SEE IF IT SHOWS UP OUT BETTER.
HORN 15+18

MAR 10 1917

DARK WAX NO. 4.

SAME AS #3 ENTIRELY,
2A RECORDER. $\frac{1}{1000}$ STYLUS.
HORN 18 R.M. DICH 13

MAR 10 1917

DARK WAX NO. 5.

DISC. - SURFACE EXPERIMENT NO. 4587A.
COMMERCIAL PRINT.
SPEAKER NO. 5, 80 R.P.M.
HORN NO. 13

CYLINDER: - DARK WAX BLANK

H.M. FEED
RECORDER NO. 2, $\frac{1}{1000}$ STYLUS
DIAMETER OF DARK WAX $2\frac{1}{32}$ "
80 R.P.M.
HORN NO. 18.

MAR 10 1917

LIGHT WAX NO. 6.

SAME AS NO. 5 ONLY ON LIGHT WAX.
DIAMETER $2\frac{1}{32}$ "

MAR 12 1917

DARK WAX NO. 7

DISC. SURFACE EXPERIMENT NO. 4587A
COMMERCIAL PRINT.
SPEAKER NO. 5 - 80 R.P.M.
HORN 13.

CYLINDER: -

DARK WAX BLANK.
H.M. FEED, .008 NEEDLE.
RECORDER NO. 2. (CHANGED TO .008
DIAMETER DARK WAX $2\frac{1}{32}$ "
80 R.P.M.
HORN #18.

MAR 12 1917

LIGHT WAX NO. 8

SAME AS #7 ONLY DIFFERENCE
IN WAX.

MAR 12 1917

LIGHT WAX NO. 9.

DISC:- SURFACE EXPERIMENT NO. 4587A

COMMERCIAL PRINT.

SPEAKER NO 5 - 80 R. P. M.

HORN 13.

CYLINDER:- LIGHT WAX BLANK.

H.M. FEED

.008 STYLUS.

RECORDED 22.

DIAMETER OF BLANK $2\frac{1}{32}$ "

160 R. P. M.

HORN #18.

MAR 12 1917

DARK WAX NO. 10.

DISC:- SURFACE EXPERIMENT NO. 4587A.

COMMERCIAL PRINT.

SPEAKER NO. 5 - 80 R. P. M.

HORN 13.

CYLINDER:- DARK WAX BLANK.

H.M. FEED

.008 RECORDS NO. 77

DIAMETER OF BLANK $2\frac{1}{16}$ "

160 R. P. M.

HORN #18.

FOR MR. EDISON.

APR 3 - 1917

LONG DISTANCE RECORDING.

*30 CYLINDER REPRODUCING MACHINE

65 ft. from Horn of Recording Machine
IN BUILDING #4.

KINETO HORN ON RECORDING MACHINE

RING COTTON MACHIN - BAND ON REPRODUCING
MACHINE

*8A RECORDER USED.

.008 NEEDLE

80 R. P. M. RECORDING MACHINE

160 R. P. M. REPRODUCING MACHINE.

1ST. TRIAL INSIDE BUILDING #4

2ND TRIAL OUTSIDE OF BUILDING #4 ON PATH.

APR 3 - 1917

LONG DISTANCE.

*35 RECORDER

1ST TRIAL 60 ft

2ND " 44 "

3RD " 34 "

4TH " 24 "

5TH " 14 "

INSIDE
BUILDING
#4

SAME AS ABOVE OTHERWISE.

#14.

APR 11 1917

SOUNDS IN AIR, RECORDED IN LAB. YARD.
AT ABNT 1:30 P.M.

H.M. CYLINDER, GRAPHITED.
008 STYLUS IN RECORDER NO. 2.
LARGE BRASS HORN. H.M. FEED
160 K.P.M. RECORDING MACHINE.

PRINCIPLE SOUNDS:-

3 TROLLEY CARS ON FIRST HALF OF CYL.
FRED GET IN ELECTRIC AUTO PASSED IN
FRONT OF HORN.
AUTO TRUCK. BRITISH EXPRESS WAGON,
HAMMERING IN LAB.

#15

APR 11 1917

SOUNDS IN AIR, RECORDED IN LAB. YARD. 1:40 PM
SAME AS NO. 14 ABOVE. EXCEPTING SOUNDS
PRINCIPLE SOUNDS.

TROLLEY CAR.
AUTO TRUCK & HORN
MAN WALKING IN FRONT OF HORN.
FORD AUTO IN YARD, EARLY CLOSE.
HAMMERING IN MACHINE SHOP OF LAB.
" ON AUTO IN YARD.
LABORATORY DOOR SLAMMED.

#16

APR 11 1917

SOUNDS IN AIR, RECORDED IN LAB. YARD. 1:45 PM
MECHANICALLY SAME AS #14 AND 15.

PRINCIPLE SOUNDS.

CHARLIE DALLY TALKING TO MR. EDISON 70' from them
TROLLEY CAR PASSING LAB.
LOAD TAKING INSIDE OF CHEMICAL ROOM.
LAB. MACHINING SHOP DOOR SLAM.
MEN CUTTING STONE BACK OF BALLY BUILD.
LAB. DOOR SLAMMED.
FORD AUTO.
HAMMERING HEAVY TIMBERS IN PAINT. YARD.
TROLLEY CAR.
PUMP RUNNING BY CHEMICAL ROOM.

#17.

APR 11 1917

MECHANICALLY SAME AS #14 ONLY 2 PM
WITH 040 STYLUS IN RECORDER #7.
9 AM FEED.

PRINCIPLE SOUNDS:-

WAGON IN STREET.
TROLLEY CAR. ABOUT 1/2 WAY OVER.
AUTO DOOR SLAMMED.
AUTO HORN ON END.

APR 18 1917

#18.

1st trial.

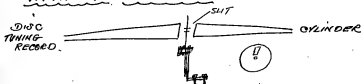
TUNING RECORDED FROM DISC RECORD TO CYLINDER.

.008 NEEDLE IN RECORDER *2A.

HORNS - 13 + 14.

CYLINDER RUNNING 100 R.P.M.

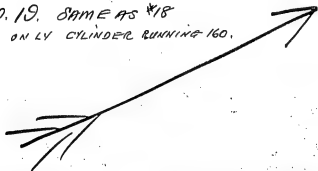
WITHOUT SHUTTER.



2ND TRIAL
SAME AS 1ST, ONLY WITH SHUTTER.

NO. 19. SAME AS #18

ON LV CYLINDER RUNNING 160.



Niles -

APR 18 1917

Werner - Use tuning record & duplicate it strongly on the cylinder by your duplicating funnel.



But use a shutter revolving 8 times as fast as the cylinder 480 Rev.

There is a slit near end + inch wide which ~~lets~~ sound for an instant pass.

I want to find if record stops instantly or continues a little after sound cuts off

or

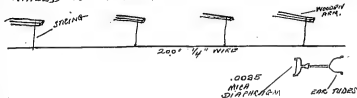
Thus
Change to Edison & record 129

Bally - get sect. No 4 $\frac{1}{4}$ inch iron wire, should I cut it on hang on strings - put over sound & was listening tubes - scratch the other end - also wind end along for 6" 3 or 4 layers use Ray & Gullery make dots.
Etc

APR 17 1917

APR 23 1917

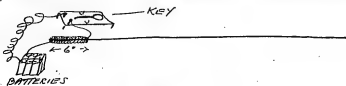
SUSPENDED 200 ft. $\frac{1}{4}$ " IRON WIRE ALONG LAB. FENCE, FROM WOODEN ARMS NAILED TO FENCE, WIRE HUNG BY STRINGS



SCRATCHED END OF WIRE WITH ORDINARY PIN AND COULD HEAR IT VERY PLAINLY AT OTHER END BY PLACING DIAPHRAGM WITH EAR TUBES, AGAINST OTHER END OF WIRE.

WOUND END OF $\frac{1}{4}$ " WIRE WITH SINGLE COATED COTTON, .042 COPPER WIRE, 3 LAYERS, 4 FOR 6", CONNECTED WITH TELEGRAPH KEY & BATTERY, COULD HEAR DOTS VERY PLAINLY AT OTHER

END OF WIRE, BY EAR TUBES & DIAPHRAGM.



~~APR 27 1917~~ APR 27 1917

3 LAYER COIL OF .042 (SINGLE COATED COTTON) WIRE, $\frac{3}{4}$ " HOLLOW CORE. N
HELD THIS COIL OVER END OF 200' $\frac{1}{4}$ " IRON WIRE, CONNECTED WITH KEY & BATTERY.

DOTS PLAINLY HEARD AT OTHER END OF WIRE. THEN DIAPHRAGM & EAR TUBES.

($\frac{1}{4}$ " WIRE REMOVED FOR NEW FENCE CONSTRUCTION.)
 $\frac{1}{2}$ 7/8 A.M.

INSIDE OF COIL NOT TOUCHING $\frac{1}{4}$ " WIRE.

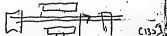
APR 27 1917

TRIED ABOVE COIL, WITH $\frac{1}{4}$ " WIRE ON THE GROUND, 6 DRY CELLS. COULD HEAR IT, BUT MUCH WEAKER THAN SUSPENDED.

1 + 2 DRY CELLS CAN NOT HEAR

3, 4, 5 ABOUT SAME.

COIL NOT TOUCHING WIRE, (C) (C) COIL
CENTERS IN EITHER END OF COIL WITH
 $\frac{1}{4}$ " HOLE IN THEM.

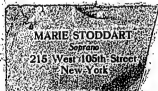


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**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-15-08-02.1**

This notebook was used during August 1915-July 1916 by Absalom M. Kennedy as a record of experiments with phonograph recorders. Each entry contains the number of the recorder, ranging from 52 through 134, along with comments about components such as head, diaphragm, arm, and sapphire needle and the type of disc used. Edison's opinions about the quality and loudness of the recordings are occasionally mentioned in Kennedy's notes. Inserted into the book is a communication from Kennedy requesting permission to teach employee E. Rowland Dawson how to make stretched recorders, along with Edison's affirmative response. The front cover is labeled "Record of Recorders." The pages are unnumbered, and at least one page has been removed from the book. Approximately 75 pages have been used.

- Record #52 -

Brass Head - Knife Edge Pattern
1 1/2" diameter.

Diaphragm of Japanese Paper,
.001" thick - given 2 thin coats
of shellac - & increasing thickness
to .001 1/2"

Tried first with T arm direct
to diaphragm. Too much
surface and not very loud.

Next shellacked an aluminum
disc of 1/8" .0035 to center. This
diminished surface & improved
loudness & made trifle more
full.

Recorder #53-
(Made 8-2-15)

Brass Head - Knife Edge Pattern
 $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper
impregnated with #1207 Condensate
Transfer Varnish and dried,
.0025" thick.

Original aluminum disc $7\frac{1}{8} \times .008$
removed.

Regular aluminum arm and
.008" sapphire.

Recorder #66.

Brass Head. Domed Top. Knife
Edge Pattern. $1\frac{1}{16}$ " diameter.

Diaphragm of Paper. Paper .001"
given 2 thin coats of shellac &
dried bringing up to .0015".

Cork cone $3/4 \times 1/16$ " on outside,
shellacked diaphragm and
cone and diaphragm given
4 coats of shellac & dried.

Regular aluminum arm
and $3/8$ " sapphire.

Recorder #70.

Brass Head; Knife Edge Pattern
 $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper
.001" thick, given 2 thin coats
shellac & dried to .0015" thick.

Cork Cone $\frac{1}{8}$ " x $\frac{1}{16}$ " shellacked to
outside of Diaphragm. Cone
and diaphragm given 4 coats
shellac.

Regular aluminum arm and
.008" sapphire.

Recorder #54.

Brass & lead. Domes Gap.
Knife Edge Pattern. $1\frac{1}{2}$ " diameter.

Diaphragm of Japanese Paper
001" given 2 thin coats of
shellac & made to .0015".

Cork cone $\frac{3}{4}$ " x $\frac{1}{16}$ " shellacked to
inside of diaphragm. Cone
and diaphragm given 4 coats
shellac.

T shaped Walter Muller arm
and regular 008" sapphire

Recorder #59.

Brass wheel. Domed Top.
Knife Edge Pattern, $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper
.001" given 2 thin coats of
shellac and brought up to
.0015".


Cork Cone $\frac{3}{4}$ " x $\frac{1}{16}$ " shellacked to
inside of diaphragm. Cone
and diaphragm given 4 coats
of shellac.

Regular aluminum arm and
.008" sapphire.

Recorder #70 Made over

Brass Head. Knife Edge Pattern
 $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
paper .0007" thick wet with
alcohol and given 2 thin coats
shellac & dried .001" thick.

Cork cone  coated
with shellac all over &
shellacked to diaphragm.

Turned aluminum arm
spliced to knife edge with
shellac. Regular 60° sapphire

To - 3rd -
Planoconv

Recorder #65

Brass Head, Domed Top.
Knife Edge Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
Paper - .0007" thick - wetted
with alcohol and given 2
thin coats of shellac.

Cork cone  $\frac{1}{8}$ " coated

with shellac all over &
shellacked to diaphragm.

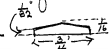
Tapered aluminum arm
fastened to knife edge
with shellac

Regular .008" sapphire.

Record #66.

Brass/Lead - Domed Tap.
Knife Edge Pattern - $1\frac{1}{4}$ " diam.

Diaphragm of new Japanese
Paper - .0007" thick - wetted
with alcohol and given 2
thin coats of shellac.

Cork cone  coated
with shellac all over and
phelacked to diaphragm.


Tapered aluminum arm
fastened to knife edge with
shellac.

Regular .008" sapphire.

Reorder #73.

Brass head, Knife Edge Pattern
1 1/4" diameter.

Diaphragm of new Japanese
paper, .0007" thick - etched
with alcohol and given 2
thin coats of shellac.

Cork cone  1/2" coated
with shellac on both sides
and shellacked to diaphragm.

Tapered aluminum arm,
shellacked to knife edge
Regular .008" sapphire.

70

Brass Head. Knife Edge Pattern
 $1\frac{1}{4}$ " diameter.

Diaphragm of New Japanese
Paper .0067" thick - wetted with
alcohol and given 2 coats of
shellac.

Aluminum Disc .003" $\pm \frac{1}{4}$ "
phased to center.

Tapered aluminum arm and
.003" Sapphire.

M. E " Blues" - 80% loud.

#73

Brass lead. Knife Edge Pattern
1 1/4" diameter.

Diaphragm of New Japanese Paper
.0007" thick - Juvellied with alabaster
and given 2 coats (thin) shellac.

Aluminum disc .003" x 1/4"
shellacked to center.

Tapered aluminum arm
and .008" sapphire.

Tapered aluminum arm
and .008" sapphire.

Mr. E says "Blubs" -

#55

Brass v head domed Tap.
Knife Edge Pattern - $1\frac{1}{2}$ " diameter.

Diaphragm of new Japanese
Paper .0007" thick - wetted with
alcohol and given 2 coats of
thin shellac.

Aluminum disc $1" \times .0015"$ shellacked
to diaphragm at center.

Tapered aluminum arm
shellacked to diaphragm .008"
Sapphire

Mr. E. G. Gino -
Quality 75%
Sound 80%

#57-

Brass head. Knife Edge
Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of Japanese Paper
0007" thick - drilled with
alcohol and given 2 thin
Coats shellac.

Aluminum disc $1\frac{1}{2}$ 0015"
shellacked to center of
diaphragm.

Tapered aluminum arm
waxed to edge of
diaphragm. 0008" edge sphere

Mr. E gives Load 110% }
Quality 115% }

as compared with
#57.

#54-

Grass Head, Domed Tap-
Knife Edge Pattern - 1/4" diam.

Diaphragm of New Japanese
Paper .0007" thick, wetted
with alcohol and given 2
thin coats of shellac.

Mica Disc .0025" x 1"
shellacked to center of
diaphragm

Tapered Aluminum arm
welded to edge of
diaphragm.

M. E. gives Load 80%
Load 75%.

#73

Brass Head - Knife Edge Pattern.
1 1/4" diameter.

Diaphragm of New Japanese Paper
.0007" thick - Dipped with alcohol
and given 9 thin coats of shellac.

Aluminum Disc 1" x .0015" shellacked
to center.

Tapered aluminum arm shellacked
to edge of diaphragm.

.008" sapphire.

Mr. E. Camp "Sketches"

#70

Brass Head. Knife Edge Pattern
1 1/8" diameter.

Diaphragm on 2 new Japanese
Pakel-0007" thick, wetted with
alcohol and given 2 thin coats
of varnish.

Aluminum disc on center
(phosphor) 1 1/8" x .0015".

Tapered aluminum arms raised
to edge of diaphragm

.008" sapphire.

Mr E Lays "Rend 70"
"Dial 80"

#55

Brass Head, Domed Top,
Knife Edge Pattern - $1\frac{1}{4}$ " diam.

Diaphragm of new Japanese
Rex - .0007" thick - lapped
with glass and union 7
thin coats of shellac.

Engraved Aluminum Disc
1" 20015" - flange to center -

Tapered aluminum arm
shear to edge of diaphragm
0.08" cap thickness.

Mrs. E. Camp "Head 75"
"Base 75"

#5L

Brass Head-Domed Top- Knife
Edge Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
Paper - .0007" thick - milled
with corkle and given V
thin coils of shellac

Aluminum Disc $1\frac{1}{4}$.0015"
Shellacked to center.

Tapered aluminum arm,
shellacked back of Knife Edge
as per directions Mr. E.

.008" Sapphire.

Mr. E says "Grashed too deep
or made scratches"

#66

Brass head - Domed Top - Knife
Edge Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
Paper - .0007" thick & mottled
with alcohol and given
2 thin coats of Shellac

Softened Aluminum Disc
 $1\frac{1}{2}$.0015" Shellacked to center.

Tapered aluminum arm
shellacked to edge of
diaphragm.

.008" sapphire.

Mr. E says "nearly as good as
of but a little secondary"

65

Brass Head - domed Top - Knife
Edge Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
Paper .0007" thick, wetted with
alcohol and given 2 thin coats
of Shellac.

Special aluminum disc - dome

cut column, shellacked.



made of .0015" aluminum.

Tapered aluminum arm, shellacked
behind knife edge.

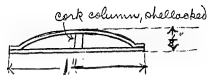
.008" sapphire.

#75-

Brass Head - Knife Edge Pattern
1 1/4" diameter.

Diaphragm of new Japanese
Paper - .0007" thick, wetted with
alcohol and given 2 thin coats
of shellac.

Special aluminum disc-dome



made of .0025" sheet aluminum.

Tapered aluminum arm, shellacked
behind knife edge.

.008" sapphire,

765 19a

#76

Grass Head. Knife Edge
Pattern - $1\frac{1}{4}$ " diameter

Diaphragm of new Japanese paper
.007" thick, wetted with alcohol
and given 2 thin coats of
shellac

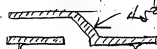
Aluminum disc .0025" x 1"
shellacked to center of diaphragm

Tapered aluminum arm
shellacked behind knife edge.

.008" sapphire

#79

Brass Head - Knife Edge Pattern



with 45° face in tube.
1 1/4" diameter.

Diaphragm of ^{new} Japanese Paper
.0007" thick wetted with alcohol
and given 2 thin coats of
shellac.

Aluminum Disc .0025 x 1"
shellacked to center of
diaphragm.

Tapered aluminum arm
shellacked behind knife edge

.008" Sapphire,

90° Round
100° Dial
no corner wear
as in all other
insulating 5007-

TIGHTENED
Screw 7 1/2"
Screw 7 1/4"

#74-

Brass Head - Knife Edge
Pattern - $1\frac{1}{4}$ " diameter.
Top shaped as shown



Diaphragm of New Japanese
Paper, .007" thick, wetted with
alcohol and given two thin
coats of shellac.

Aluminum Disc .0025" x 1"
Shellacked to center of diaphragm.

Tapered aluminum arm shellacked
behind knife edge.

.008" sapphire.

{ Load 80%
Fuel 70% }

#77

Brass Head - Knife Edge Pattern
 $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese
Paper .0067" thick, wetted with
alcohol & given 2 coats of
shellac.

Aluminum disc .0025" x 1"
shellacked to center of
diaphragm.

Tapered aluminum arm with
foot shellacked behind knife
edge

.008" capstone.

1974/12

78.

Brass Head - Knife Edge Pattern
1 1/4" diameter.

Diaphragm of New Japanese Paper
.0007" thick, wetted with alcohol
and given 2 coats of shellac.

Aluminum disc 1 1/16 x .0015"
shellacked to center of diaphragm.

Tapered aluminum arm
with ~~flat~~ shellacked behind
knife edge.

.008" sapphire.

10/14/60

#71

Brass Head - Knife Edge Pattern
1/4" diameter.

Diaphragm of new Japanese Paper
.0007" thick, wetted with alcohol
and given 2 coats of shellac.

aluminum disc, .0015" x 1/16"
shellacked to center of diaphragm

Tapered aluminum arm,
with tail shellacked behind
knife edge.

.008" sapphire

12/15/15

#65

Brass Squad-Knife Edge Pattern
Domes Top - $1\frac{1}{4}$ " diameter.

Diaphragm of New-Japanese
Paper 0007" thick, wetted with
alcohol and given coats
of shellac.

Aluminum Disc .005" x $1\frac{1}{16}$ "
shellacked to center of diaphragm

Tapered aluminum arm with
tail shellacked behind knife edge.

.008" sapphire.

10/15/15-

#75.

Brass Head-Knife Edge Pattern
1 1/4" diameter

Diaphragm of New Japanese
Paper .0067" thick mottled with
alcohol and given 2 coats of
shellac.

Aluminum Disc $\frac{1}{16}$ " x .0015"
shellacked to center of
diaphragm.

Tapered aluminum arm
tail shellacked behind knife
edge

.008" sapphire.

12/15/15

#77.

Brass Head - Knife Edge
Pattern - $1\frac{1}{4}$ " diameter. - 45° back

Diaphragm of New Japanese
Paper .0007" thick, matted
with alcohol and given
2 coats of shellac.

Aluminum Disc $\frac{45}{16}$ x .001"
Shellacked to center of
diaphragm.

Tapered aluminum arm,
tail shellacked behind knife
edge.

.008" sapphire.

12/16/15

#78

Brass Head - Knife Edge Pattern.
 $1\frac{1}{4}$ " diameter - 45° back.

Diaphragm of New Japanese
Paper .0007" thick, milled
with alcohol and given 2
coats of shellac.

Aluminum Disc $\frac{5}{16}$ " x .001"
shellacked to center of
diaphragm.

Tapered aluminum arm,
tail shellacked behind knife
edge.

.008" sapphire

12/16/15.

#79

Brass Head - Knife Edge Pattern
 $1\frac{1}{4}$ " diameter - 45° Back.

Diaphragm of New Japanese
Paper .0007" thick thick, wetted
with alcohol and given 2
coats of shellac.

Mica disc $\frac{1}{16}$ " x .0012" shellacked
to center of diaphragm.

Tapered aluminum arm
tail shellacked behind knife
edge.

.008" sapphire.

#54.

Brass Head. Domes Top
Knife Edge Pattern - $1\frac{1}{4}$ " diameter.

Diaphragm of new Japanese Paper
0007" thick, wetted with alcohol
and given 2 coats of shellac.

Aluminum Disc $\frac{1}{16}$ " x .0015" .
Shellac tied to center.

Tapered aluminum arm - tail
shellacked behind knife edge.

.008" sapphire.

#65

Brass Head - Tapered Tube - Domed
Head - Knife Edge Pattern - $1\frac{1}{4}$ " diam.

Diaphragm of new Japanese Paper
.0007" thick - dipped with alcohol and
given 2 thin coats of shellac.

Aluminum Disc $\frac{7}{8}$ " .0015" shellacked
to center of diaphragm.

Tapered aluminum arm - tail
shellacked behind knife edge.

.002" sapphire.

Accept as
Standard

#66

Brass Head - Tapered Tube - Domes Head
Knife Edge Pattern - $1/4$ " diameter.

Diaphragm of New Japanese Paper
.0007" thick - dipped with alcohol
and given 2 thin coats of phellac.

Aluminum Disc $\frac{7}{16}$ " x .0015" phellacked
to center of diaphragm.

Tapered aluminum arm
phellacked behind knife edge.

.008" sapphire.

12/27/14-

64

Brass Head - Tapered Tube -
Domed Head - Knife Edge Pattern
1/4" diameter.

Diaphragm of new Japanese
Paper, .0007" thick. Wetted with
alcohol and given 2 thin coats
of shellac bringing up to
about .001".

Aluminum Disc $\frac{7}{8}$ " \times .0015"
shellacked to center of
diaphragm.

Tapered Aluminum arm
shellacked behind knife edge
.008" sapphire.

1927/15.

75

Brass Head. Knife Edge Pattern
1/4" diameter.

Diaphanymy of Old Japanese
Paper, .001" thick put into methyl
alcohol, given 2 thin coats of
shellac, dried and given 2
more thin coats bringing
thickness to about .0015"

Aluminum disc $\frac{7}{8}$ " x .0015"
shellacked to center of
diaphragm.

Tapered aluminum wire
shellacked behind knife
edge.

.008" ec. pphire.

17/27/15

#66

Brass Head. Knife Edge Pattern
1/4" diameter - Paper Tube Bomed
Head.

Diaphragm of Old Japanese Paper
.001" thick wetted with alcohol,
given 2 thin coats of shellac,
dried and given 2 more thin
coats bringing thickness to between
.0015 and .002".

aluminum disc $\frac{7}{8}$ " x .0015"
shellacked to center of
diaphragm.

Tapered aluminum arm
shellacked behind knife edge.
.003" sapphire.

#55

Brass & lead - Domed Tap
Knife Edge Pattern - $1\frac{1}{4}$ " diameter,

Diaphragm of Old Japanese Paper
.001" thick - wetted with alcohol
given 2 thin coats of shellac
dried and given 7 additional
thin coats of shellac bringing
thickness to between .005 and .002"

Aluminum disc $\frac{7}{8}$ " \times .0015"
shellacked to center of
diaphragm.

Tapered aluminum arm
shellacked behind knife edge.

.008" sapphire.

Reorder #132

Head 1" - Domed Top.

Diaphragm - Jap. Paper - Gesso shellac
.0015" - reticulated lines applied.

Disc aluminum $\frac{1}{8}$ " .0015"

Arm Support Al. cone $\frac{1}{8}$ " diam - $\frac{1}{8}$ " high of
.0015" oak, center support of
ball of cotton & wax.

Sapphire Arm - Special - Papered - 0.003"
aluminum, stuffed with
cotton. Mounted with silk
thread.

Sapphire Regular .002"

Remarks - On instrumental records -

Violin, Piano etc. This
gave best results to 4/1/16.

Surface good. Starts out
of horn better than any other
than #100. Shows excellent
definition.

Reorder 4/4/16.
#129.

Head - 1" diameter - Banded Top:
Diaphragm. Pop. Paper. 8 coats phillac. 0015.
Etched before applied.

Dice, Aluminum 7/8" 0015"

Arm Support. Al. Cone 4 1/2" diam. 1/8" high of
0015" tank, center support of
cotton & wax.

Sapphire Arm Special Exposed .02, .008" al. stuffed
with cotton. Mount with silk thread.
Sapphire Regular 00-8.

Revoluer #131.

Head - 1" diameter. Domes Top.

Diaphragm - Jap. Paper. Beats's phlac. .0015" stretched before applied. $\frac{3}{8}$ " hole in center.

Disc - aluminum $\frac{3}{4}$ " x .0015"; phlacated concentric with $\frac{3}{8}$ " hole in diaphragm.

Firm Support - Al. Cone $\frac{3}{8}$ " diameter, $\frac{1}{8}$ " high of .0015" stock, center support of cotton and wax.

Sapphire Arm - Special, Tapered - of .008" Al. stuffed with cotton wound with Oak thread.

Sapphire - .008" - Regular.

Reorder # 102.

- Head - 1" diameter. domed top.
Diaphragm - Jap. Paper. Dipped in #1207 Condensite
Transfer Varnish & Dried (about 3 mos)
.0025" thick.
Disc - Aluminum. $\frac{5}{8}$ " x .0015"
Arm Support - Al. Cone $\frac{3}{8}$ " diameter - $\frac{1}{8}$ " high of
.0015" stock, center support half of
cotton & wax.
Sapphire Arm - Special Tapered. of .008" stock
stuffed with cotton & wax
with thread.
Sapphire Regular .008"

Remarks - Dawson Reports "More quality
& seems firmer to me than others.
think it would stand more
punching if necessary. Surface
OK.

All before thought it weaker
in volume than 132 but light
shows it infinitely louder
than 132 or 131! Doesn't seem
full either. Very clean &
nice.

5/29/16.
Reorder #107

Head
Diaphragm

1" diam. domed top.
Skin from Mrs. Maguire,
2701 Chas. Ave., Chicago.
.0125" thick. Stretched on
supplemental stretch before
applied.

Disc

Aluminum, domed, pressed
and tempered in die. $\frac{7}{8}$ "
diameter, domed $\frac{1}{16}$ " high
of .0015" stock.

Sapphire
Arm.

Special - tapered - of .008" stock
stuffed with cotton & wound
with silk thread.

Sapphire

Regular .008".

5/29/16
#104

Head
Diaphragm

1" diameter, domed top
Skin, from Mrs. Margerlein,
2701 Archer St., Chicago.
.0015" thick stretched on
supplemental stretchers before
plying.

Disc

Aluminum, .0010" stock, domed
pressed stamped in die,
1/8" high - 5/8" diameter.

Sapphire
Arm

Special, tapered, of .008"
aluminum stock, stuffed
with cotton & wound with
silk thread.

Sapphire

Regular .008"

#104 - Tested 7/8/16.
Meak looks firm true and
natural. Only about 80%
as loud as #100.

7/11/16 Mr. E tested. "Meaker
than 192".

7/7/16

#104 - ✓
Brass head - 1" diam. Bomed
Top. Knife Edge Pattern.

Diaphragm of 3 thicknesses
of Jap tissue - shellacked
and pressed flat to .003".

Aluminum cone - pressed
of .0015" stock - $\frac{5}{8}$ " diameter,
 $\frac{1}{8}$ " high with waisted cotton
plug at center.

Aluminum arm of .008" stock
tapered, stuffed with cotton
and wound with silk cord.

Regular .008" sapphire. Ex-
amined under microscope
shows smooth edge slightly
coarsened on outside and
slightly tapered.

#127

Tested 7/10/16. Loud and very full but natural for violin. Will test further to confirm.

7/11/16 Mr. E. tested. Louder and better on piano than 132 - too sensitive & blows on violin. Try further back with violin.

7/10/16.

#127

✓ Brass Head. Domes Top.
1" diameter. Knife Edge Pattern.

Diaphragm of 2 thicknesses of Jap. Tissue - Phellacked and wet pressed to .002".

Aluminum Cone pressed of .0015" stock - $\frac{5}{8}$ " diameter, $\frac{1}{8}$ " high with waxed cotton plug at center. Rued on top

Aluminum arm of .008" stock, tapered, stuffed with cotton and wound with sick cord. no feet

Regular .008" sapphire. Examined under microscope shows taper and slight coking at edges.

7/11/16
#115 - Brass Head, Dome Top. $\frac{1}{8}$ " diam.
Knife Edge Pattern.

Diaphragm - thickness of
waxed paper .00125" -
healed & flattened before being
screwed down as diaphragm.

Aluminum cone of .0015" took
 $\frac{1}{8}$ " diam. $\frac{1}{8}$ " high pressed.
Naked cotton plug in center.
Roll on top.

Aluminum cone .0008" took
tapered - no foot.

Regular .008" sapphire. Exam
- motion with microscope
shows this straight (without
taper).

7/11/16

✓
#107- Brass Head - Domes Tap -
1" diameter - Knife Edge Pattern.

Diaphragm - 2 thicknesses of
Standard shellacked gap paper
as used in Disc Reproducers,
.002 1/4" thick - heat pressed.

Aluminum cone of .0015" stock
5/8" diameter - 1/8" high with
roller on top.

Tapered aluminum arm,
no foot. Stuffed with
cotton, and wound with
Silk Thread.

Regular .008" sapphire. R.
- shaped under microscope
showed that it was tapered
and had a corked edge -
smooth but dulled.

#117 -

7/12/16

Brass Head - $\frac{1}{8}$ " diameter -
Dome Top. Knife Edge Pattern.

Diaphragm 1 thickness Japs Paper
shleaked - .00125" thick - heated
& stretched before being screwed
down.

Aluminum cone .01, .0015" thick -
 $\frac{1}{2}$ " diam - $\frac{1}{8}$ " high - wired cotton
plug in center.

Aluminum arm .008" stock
tapered. stuffed with cotton -
no fast.

Regular .008" sapphire, Examined
under microscope shows
straight but with, corked
edge - not very sharp.

7/12/16.

#131- Brass Head - 1" diameter -
Domed Top - Knife Edge Pattern.

Diaphragm - 2 thicknesses of
Zap. paper, heated and pressed
to .002".

Aluminum cone of .0015" stock,
5/8" diameter - 1/8" high - waxed
cotton plug in center.

Aluminum arm of .008" stock
tapered, stuffed with cotton and
wound with silk thread.

Regular .008" sapphire. Examined
under microscope shows
somewhat tapered and corbelled -
not very sharp.

7/14/16

#120 - Brass head - $\frac{1}{4}$ " diameter,
domed top - knife edge pattern.

Diaphragm - thickness .002",
tissue, shellacked .002", gritted
and heated before being screwed
down.

Aluminum cone of .0015" stock,
 $\frac{1}{2}$ " diameter - $\frac{1}{8}$ " high, waxed
cotton plug in center

Aluminum arm of .008" stock,
tapered - no foot - stuffed
with cotton, pollen between
arm and cone.

Regular .008" sapphire. As
arrived under microscope
shows straight - slightly corked.

7/14/16

#102 - Brass Head - 1" diam, domed
Top - Knife Edge Pattern.

Diaphragm - thicknesses of
shattering top, twice - covered
with lead .0015" thick, $\frac{7}{16}$ hole
cut in center,

Dome of aluminum - .0015" stock
 $\frac{7}{16}$ " diameter - $\frac{1}{8}$ " high with
roller wheel on top.

Aluminum arm - .008" stock
annealed - tapered - no fast-
cluffed with cotton.

Regular .008" sapphire. Under
microscope shows that it
has been worked.

Weak & slight particle

7/14/16

#134 ✓ - Brass head - Special angle rubber
domed - 1" effective

Diaphragm of mica .001"

Dome - aluminum - .0015" stock
5/8" diameter, 1/8" high with
roller on top - cotton & wax
center plug.

~~Aluminum - .008" stock,
tapered top foot - stuffed
with cotton~~

Regular .008" sapphire. Micro-
scope shows straight and
only slightly cocked

#132 - 7/17/16

Better than before - About as loud
as 132 - not as firm & true. Good
on piano. Fuller than 132.

7/15/16.

#134 - Brass head - Special angle Ribbles
- domed - 1" effective diameter.

Diaphragm of mica -.0007"
1/8 hole cut out in center and
magnesium disc .002 x 5/8 used
on.

Cone of .006 aluminum - 5/16" diam
x 7/64 high.

Aluminum arm of .008" stock
tapered - no feet - stuffed
with cotton.

Regular .008" cap phire.
Microscope shows straight
and slightly cocked.

#109- 7/17/16.

Very loud - 50% louder than
102. Very fuel - too fuel - bubbles
with on bubble and on loud
piano.

7/17/16

#109. Brass head - 1" diameter -
Domed - knifedge pattern.

Diaphragm - Jap paper shellstock
and stretched $7/8$ " hole cut in,
.0015" thick. Brass disc
.001" x $7/8$ " shellstock paper
ring.

Cone of aluminum, $6/1006$ "
stock - $3/8$ " diameter, $7/16$ "
high waxed on.

Arm of aluminum - .008" stock,
tapered - stuffed with cotton,
2 wires in it twisted.

Regular .008" copper pipe.
Extends under microphone
shows straight - hole
no corking.

tested 7/18/16. Powder Pan 132
big - full - stands out.

7/18/16

#121- Brass Head - 1" diameter -
Domed Top - Knife edge pattern.

Diaphragm of Japanese
paper, 1 coat Shellac, stretched.
Hole $\frac{7}{8}$ " diameter cut out
and mica disc $\frac{15}{16}$ " x .001"
shellacked over.

Dome of aluminum - $\frac{7}{8}$ "
diameter x $\frac{1}{8}$ " high of .0015"
stock. Roller on top.

Arm of .0008" aluminum,
tapered & fluffed with cotton.

Regular .003" sapphire. Shows
round & but slightly curved.

Tested 7/8/16 - Louder than #132
Bigger & fuller but not quite as
big's full as #121.

7/18/16

#113 - Brass head - 1" diameter - domed
top - Knifer Edge Pattern.

Diaphragm of Japanese Paper, least
shellac dried. Stretched. Hole $\frac{7}{8}$ "
diameter cut in center. Max disc
 $\frac{1}{16} \times .001$ shellacked over.

Disc of aluminum $\frac{5}{8} \times .0015$
warped on center. Small triangular
support for arm.

Aluminum arm of .008" stock,
tapered & stuffed with cotton.

Regular old "sapphire". Shows
tapered & evidence of being worked.

7/19/16 - About as loud as
137 - fuller & bigger but
not quite as clean & sharp

7/19/16

#126 - Brass Head - 1" diameter
Domed Top. Knife Edge Pattern.

Diaphragm of Japanese Paper,
last piece - .00125" - stretched.
Hole $\frac{7}{8}$ " diameter cut in center
over which was stretched
a disc of mica $\frac{5}{16} \times .00125$

Magnesium disc $\frac{7}{8} \times .002$
waxed to center of mica.
Arm supported by triangular
piece $\frac{1}{8}$ " base $\times \frac{1}{8}$ " high.

Arm of .005" aluminum,
tapered no foot - stuffed
with cotton.

Regular .004" sapphire. Shows
straight - slightly if at all
cracked - slight marks.

7/20/16 - Turned sapphire. Shows good
cut.

#128 - 7/19/16. Shows about
as loud as 132. Shellers
higher than 126 & does not
hold as well. About as
big as #113.

#128 - 7/19/16
Brass Head - 1" diameter -
Dome Top. Knife Edge Pattern.

Diaphragm of Japanese Paper,
1 coat shellac .00125" - stretched.
Hole $\frac{7}{8}$ " diameter cut in center
over which shellacked a disc
of mica $\frac{7}{16} \times .001$ "

Magnesium disc $\frac{9}{8} \times .001$ wased
to center of mica. Arm
supported by triangular
piece of .008" aluminum
 $\frac{1}{8} \times \frac{1}{8}$ base $\times \frac{1}{8}$ " high.

Arm of .008" aluminum,
tapered to foot - stuffed with
cotton.

Regular .008" sapphire. Shows
straight - nick on right side.

7/21/16 Turned Sapphire. Shows better
rough - slight nicks on cutting edge.

7/30/16 - Tested. Not quite as
good 132 - not as firm &
clean - more of the mica
route quality - this disc like.

7/30/16.

#106 - Brass head - 1" diameter - deep
domed top - Knife Edge Pattern.

Diaphragm of Jap. Paper,
1 coat shellac - Stretched, 00125
disc $\frac{7}{8}$ " diameter cut in
center - $15/16 \times .002$ " - mica.
disc shellacked over.

Disc of Aluminum $\frac{7}{8} \times .0015$
waxed to center, with triangular
support of aluminum $\frac{1}{8} \times \frac{1}{8}$
base $\frac{1}{8}$ " high - for arm.

Aluminum arm of .003" stock
tapered - no feet - clamped with
cotton.

Regular .003" Sapphire. Seams
straight & slightly corked.

#105- 7/21/16 - not as loud as
134 - true & clean.

7/21/16.

#105 - Brass head - Dome Top.
Knife Edge Pattern - 1" diameter.

Diaphragm of 2 thicknesses
of Jap tissue, shellacked
& pressed with heat .0015".

Disk of Magnesium .002"
x $\frac{5}{8}$ " diameter, triangular
aluminum support for
arm $\frac{1}{8}$ x $\frac{1}{8}$ " base x $\frac{1}{8}$ " high.

Arm of .008" aluminum,
tapered bluffed with cotton -
no foot.

Regular .003" of fine brass
straightened with steel
coiled.

Very Near

#114 - Brass Head - Flat top - 1" diam.
Knife Edge Pattern -

Thapragm - two thicknesses of
 1/2" x 1/2" x 1/2" - 1/2" x 1/2" x 1/2"
 thick plates & joined together.

~~Disc of Magnesium - 002
x 5/8", thickness 1/8" ports
for 1/8" x 1/8" holes
base 1/8" x 1/8" x 1/8"
aluminum~~

Arm of ~~205~~ aluminum.
toped, ~~205~~ with cotton
swords with thread. No feet

Regular, 808" onyx, fine,
shows straight & little, if
any curved. Small mark on
left side.

#127 Neck & lot of
Surface.

7/25/16

#122-

Brass head - domed top - 1" diam.
Knife Edge Pattern.

Diaphragm of Jap paper,
1 coat shellac, .00125". 7/8 hole
cut in center over which is
shelocked an aluminum disc
 $\frac{5}{16} \times .0015$ (spring). A triangular
support $\frac{1}{8} \times \frac{1}{8}$ base $\times \frac{1}{8}$ high for
arm of .008" aluminum is
wired to center.

Diagram

Arm of .008" aluminum - tapered
no feet - duffed with cotton &
surround with thread
Regular .008" sapphire. Examined
shows straight and not little
of any curved

#114- Rotten - full of surface
and very weak-

7/25/16

#114- Brass Dead-Flat top - 1" diam.
Knife Edge Pattern.

Diaphragm of Jap Paper, 1 coat
shellac - stretched - .00125"

7/8" hole cut in center over
which was shellacked an
aluminum disc $\frac{1}{16}$ " .001"

Triangular support for arm
of .003 aluminum $\frac{1}{8}$ " $\frac{1}{8}$ " base \times $\frac{1}{8}$ "
high.

Arm of .003" aluminum, tapered
filled with cotton, wound
with thread. no fast.

Regular .003" ϕ phine. Shows
slight mark. Seems straight
& better if any corked.

#114 - Heavy surface &
weak.

7/26/16

#114 - Made over as before but
with good sapphire -
shows clean cut.

Something peculiar here. Worth
study as to relative advantages
of flat & domed heads.

Turn up

#110

Fuller than 12Y - nearly
as full as 13Y but had
surface & noisy. Firm
shells well.

7/26/16

#110-

Brass Head-Dome Top - 1" diam.
Knife Edge Pattern.

Diaphragm of shellacked flap
paper. Shelled .00125" thick
with $\frac{7}{8}$ " hole cut out of
center over which a $\frac{1}{16}$ " x .001"
spring aluminum disc
is shellacked. Triangular
supports for arm of .008"
aluminum, $\frac{1}{8}$ " x $\frac{1}{8}$ " base x $\frac{1}{4}$ " high.

Arm up

Arm of .008" aluminum,
tapered, stiffened with
cotton - no fast.

Regular .008" s.p. piece. Shows
somewhat tapered & arched.

7/27/16.

#114 - Brass Head Flat top - 1" diam.
Knife Edge Pattern.

Diaphragm of Jap Paper,
shleaked - stretched, .00125"
 $\frac{7}{8}$ " hole cut from center arm
which is shleaked a $\frac{1}{8}$ " .001"
aluminum disc.

Aluminum disc $\frac{9}{16}$ " \times .001"
waxed to center, triangular
arm support of .008"
aluminum, $\frac{1}{8}$ " \times $\frac{1}{8}$ " base \times $\frac{1}{8}$ "
high

Arm of .008" aluminum,
tapered - no foot

Regular .008" sapphire. Show
straight but has marks
which have been turned
away from cutting edge.
Poor - polished chip.

7/27/16.

#110 - Brass Head - Domed Tap. 1" diam.
Knife Edge Pattern.

Diaphragm of Dep Paper, shellacked
-.00125 - stretched. $\frac{7}{8}$ " hole
cut in center over which is
shellacked an aluminum disc
 $\frac{1}{16}$ " \times .001"

aluminum disc $\frac{7}{8}$ " \times .001" raised
to center. Triangular arm
support of .008" aluminum
 $\frac{1}{8}$ " \times $\frac{1}{8}$ " base \times $\frac{1}{8}$ " high.

Arm of .008" aluminum, tapered,
no felt.

Regular .008" guppies. Shows
somewhat tapered and corked.

7/27/16

#122 - Brass Head, Domed Top. 1" diam.
Knife Edge Pattern.

Diaphragm of Jap. Paper - heat
shutted - .00125" stretched,
7/8" hole cut in center - over which
to shellacked an aluminum
disc $\frac{15}{16}$ " x .001".

Aluminum disc $\frac{7}{8}$ " x .001
waxed to center. Arm support
triangular, of aluminum
.008" stock, $\frac{3}{8}$ " x $\frac{1}{8}$ " base x $\frac{1}{16}$ " high.

Arm of .008" aluminum - tapered
mounts with thread and stuffed
with cotton. No fast.

Regular .008" sapphire. Examined
shows straight and only
slightly corked if at all.

[ITEM(S) FOUND IN BOOK]

Mr. Edison =
Have 10 more Diamond
Disc Demonstrators to teach
latter part of this week.

Is there any objection
to teaching Dawson to make
stretched records? He can
then get them out faster
and he can continue making
when I can not.

12/6/15.

Am Kennedy

No objections go ahead—

2

[ITEM(S) FOUND IN BOOK]

Inspection - Rynt Slugg

Labo of shells on asphaltes
by ripan man

Repairmen tampering
with reproducers

Acquiring Dept | Brink Marks Brink
not supplied.

Clamp & strain

Rubber Stick

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-15-11-19**

This notebook was used by Edison, Absalom M. Kennedy, and others during November-December 1915 for notes on experimental recordings. The first few entries are by Edison. For subsequent entries, the details of the recording session are provided by Kennedy, E. Rowland Dawson, or other experimenters, with frequent comments by Edison on the quality and loudness of the recordings. Some of the entries include notes or drawings regarding the positions of instruments and voices, as well as the position of the recorder and horn. Others are very brief and include only the identifying number of the recorder or horn and a percentage, usually written by Edison, indicating quality and volume as compared to standard. The front cover is marked "Mr. Edison." The pages are unnumbered. Approximately 130 pages have been used.

66769
Acme Co.,

MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Nov 19, 1915

EXP. VIII Con.

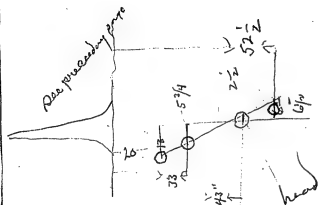


Quartet
2 Horn; Recorder # 62.

X
Pretty fair + loud
Enough for Rec. work
(but blubbers + sounds
of Recorder HQ -
Streets Recorder #62

This horn is very mellow no
 Muffled or nasal sounds
 Overtones loud giving clear
 Mellow sounds all musical

This is high water
 mark so far -



Pa

Quartet
 Horn #2 Recorder #9.

Same arrangement as X
 on preceding page

No change except used

Regular Wallis Mellow
 recorder.

This is best have heard
 yet plenty loud enough
 for Reg desc No
 interference when voices
 balanced it could be
 fine can hear each voice
 even in loudest parts

Wallis recorder
 when any of the above
 attempt voices not
 clear as not so good

over

Continued I put the
~~the~~ heavy board reflection
8 ft wide 8 ft high.

Right close to Rophams
with previous page
arrangement but
choirs confused it
because probably tenor
1/2 way between,

to make this work each
singer would have to
have a sounding board

Its better to do away
with them & use
Cow hair

I now substitute Cow
hair partitions for
reflecting board -
Cow hair all around

but floor only has thin
Carpet + walls 15 ft
up are wood

Records is ok & best yet
clear in all parts no
interference, each voice
separate, - when
proper way to balance
Volume is got can
take any record

EXP IX

We have been using horn A and speaking of it as the standard of regular recording at this time.

Mr. Miller, however, says this horn has been abandoned in his studio.

We therefore had horn made according to his description of the horn he is now using, calling it horn G.

The two are now tested.

Evening Star by Dawson

HORN A

Single 10 inches from horn

Fair to good

HORN G

Walter Miller Standard

Ringier 10 inches from horn

60% of the Volume of

A, + no better —

EXPI.

In Exp 8, when using horn #48
its crooked neck was replaced
by a straight neck in order
to let singers, sing into horn
more conveniently

Mr Edison thought possi-
bly this change may have
affected the quality of horn.

The horn is therefore tested
both ways.

Kathleen Thourneen at
three feet.

HORN 48
WITH STRAIGHT NECK

100%

HORN 48
WITH DUTCHMAN'S PIPE NECK
100% possibly 105

Horn #1

100%

EXP. I CON

HORN TESTS Continued.
#1 still being used as
standard.

HORN 50

RETRIAL -

~~100%~~ - 100%

HORN 51

RETRIAL-

90%

HORN #66

100' / 2

Norm # 67

75 2/6

Horn # 68

50%

HORN # 69

10%

HORN # 70

10%

HORN # 62

RETRIAL - First one had a
jump in the record and
you could not judge it.

105 $\frac{1}{2}$

EXP. XI.

Using an upright piano and
elevating it as described on
opposite page

Chopin Waltz by Miss Bucklander

2) Upright Piano Horn #2
Piano elevated so that centre of sound-
ing board is directly opposite horn
Piano 6 ft. from horn. Cow hair
screens forming lane about
5 ft wide between horn and
piano.

Not enough swell
Plenty loud enough
for regular records
quality tango

b) Upright Piano Horn #2

Same position as last but
with face of sounding board
covered with cow-hair diaphragm
with the exception of an 8" x 24"
opening.

Glandorp Miller
Recorder

Not so loud, seems
a little better quality
but not right

banjo-

Must be louder for

Reg disc -

EXP XII

Test of conditions as in XI,
for vocal work

Evening Star - Dawson

Voice Horn #2

Reins same as last, Singer
24" from horn Standard Miller
Recorder

Poorly good
loud enough for disc

Discs sung 4 ft from
Edge horn

About 70% of loudness
Required for disc

EXP. XIII

RECORDER TEST, conditions
same as in XI (4)

Chapin Wally, Miss Bucklinder

#9 Recorder

100

#50 Recorder

110% quality

about same, perhaps shade
worse -

EXP XIV

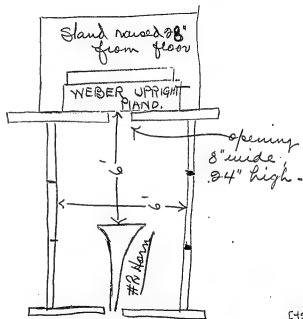
GENERAL TEST OF RECORDERS

General Test A Recorder

- 11/23/5-

Tests of Recorders

Weber Upright Piano - on stand
28" from floor. In cow hair
booth as shown, with
opening at back 8" x 24" -



Test A-

RECORDER # 8

✓

Quality 100

hard 100

RECORDER # 73 W

✓

Quality 105

hard 105

Given back
to Werner
Nov 26

XXX

RECORDER # 2 W

✓

Q 85

L 90

RECORDER # X-W ✓

Q 90

L 90

not used

RECORDER # 53 ✓

Q 90 *read.*

L 115 *read.*

RECORDER # 69 ✓

Q 100

L 100

used Sample

RECORDED # 44 ✓

Q 95 ^{Good}
L 115

RECORDED # 67 ✓

Q 103 and hat ^{spring}
L 103

RECORDED # 50 ✓

Quail 104 ^{Good quality}
L 122 ^{Very Good}

RECORDER # 62 ✓✓

Q 90

L 85 ✓

RECORDER # 58 ✓✓

Q 90

L 98 Dead

RECORDER # 51 ✓✓

Q 110

L 115

X

RECORDED #64

✓✓

Q 90
L 90

RECORDED # 52

✓✓

Qinal 85
Lund 90 truck too deep

RECORDED # 60

✓✓

Qinal 90
L 100

fallen
surface

RECORDER #66 x✓

Q 60
L 60

Made Over

Redesign

RECORDER #57 x✓

Q 75
L 75

RECORDER #54 x✓

Q 95
L 95

Made Over

REORDER #55

✓✓

Q 50

L 50

Mark Mark
May 1980

REORDER #59

✓✓

Q 60

L 60

Made Good

REORDER #71

Q ~~85~~ 85

L 75

Send back

Shirley M.
Eisen

RECORDER #68

Q 95

L 85

✓

RECORDER #65

Q 100

L 65

✓

RECORDER #40W

Q 115

L 116

XX

Just back
to normal

Cons

RECORDER # 72 ✓✓

Q 90

L 100

Shamp
7/10/1950

RECORDER # 73 ✓✓

Q 80

L 95

RECORDER # 74 W ✓✓

Q

100 to 102

L

115

Shamp
7/10/1950

Barrow #57
Heavy playing with chords.

EXP. ~~XV~~

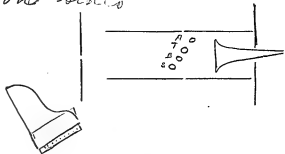
QUARTET EXPERIMENTS
(VOCAL)

Rigoletto Quartet.

Nov 21, 1915

a) Quartet

Recorder #51 Horn #8
singers in position of Exp VIII
cow hair screens at back
and on sides



Cow hair mats were placed on
floor of booth and in the second
record also suspended to form
a roof to the booth.

Mr Edison thought both
records.

"Pretty Good"

b)

Quartet

#B HORN WITH FLARE ADDED
Recorder # 51, upright piano
in position of Exp XIV, Singers
in position of XV a.

EXP XVII

TEST FOR VALUE OF FLARE
ON HORNS.

Nov 26, 1915

Kathleen Mavorrman
at three feet

HORN #43

Small square horn on which M. Edin.
wanted flare put,

WITHOUT FLARE

If this is 100%

WITH FLARE

This is 250%

7
HORN #29
Glass Horn to which flare
has been added

WITHOUT FLARE

This is 100%

WITH FLARE

This is 208%

Exp. XVII Nov 24/15

TEST FOR VALUE OF COW
HAIR ROOF TO BOOTH

Recording outfit changed in position, horn now running lengthwise instead of crossways in room. New cow-hair screens also used, same have no wood exposed on face of screens.

Booth similar to ~~III~~ IV is arranged with the new screens; piano, however being 12' instead of 6' from horn.

Evening Star Dawson

Rec. #51, piano 12 ft from horn, singer 10 ft alley, 6 ft wide, cow-hair mats on floor only, in a and also over top in it.

WITHOUT ROOF

Quality 100%

Loudness 100%

WITH ROOF

Quality 120%

Loudness 80%

EXP XVIII

TEST FOR WIDTH OF BOOTH

Super 10 ft from floor
Booth in a plane as XVII, in to only
width is changed

a) WIDTH about 6 ft

Load 100

Quality Super 100

b) WIDTH about 7 ft

Load 115

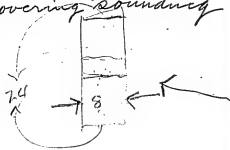
Quality Super 100

Quality Penns
not so good
as 6 ft

EXP XIX

PIANO TEST of
Conditions same as

XVIII, except for opening
in felt covering sounding
board.



Hungarian Rhapsodie - Miss Brothman

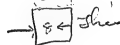
R. #51 Piano 12 ft.
from horn, with 9'x12'
cow hair on floor and
forming roof.

Opening in front of sounding board 8"x24"

This is clearer & same loudness
as Reg. to quad - I think
clearer - but records not sensitive
enough

Same as 6000 but half

Cut in $\frac{1}{2}$ (8"x9")



Quadrately graded, but

Some weak

records the 8x24

+ more sensitive records

Yellow Piano
Walter it could be greatly improved

EXP XX
TEST OF RECORDERS

Wally - Miss Brachman

Recorder # 54
If 100% This - 25%

Recorder # 59
20%

Recorder # 66
40% Quality
very good

Recorder # 70
35% - needed too
light. Quality fair

EXP XX CONT
TEST OF RECORDERS

Recorder # 9

Recorder # 67

Recorder # 73

Recorder # 69

Recorder # 44

Recorder # 50

EXP XXI

TEST OF SHELLAC
USED INSTEAD OF
WAX TO HOLD TAIL
ON DIAPHRAM

Evening Star ERD
Piano and booth as in
XXI a.

Recorder # 65

Singer at 6 ft from horn

a) BEFORE 1ST CHANGE
(Tail held in place with wax)

~~So~~ Not blue as

test last night - assuming
was made it less sensitive
~~probably by contraction of line~~

b) AFTER 1ST CHANGE
(Tail held in place with shellac)

No changes

EXP ~~XXI~~. CON.

TEST OF RECORDER
65 WITH TAIL

HELD ON WITH SHEWAC

Recorder #65
after Change
SINGER AT 2 FT.

SINGER AT 10 FT.

EXP ~~ERT~~ CON.

TEST OF Recorder #65

WITH ONE COAT OF

SHELLAC ON

DIAPHRAM.

Recorder # 65

After 2ND. CHANGE
(One Coat of Shellac on Diaphragm)
a) Singer at 6 ft.

No blub-

Not so sensitive as without

Extra Coat Shellac -

b) SAME AS a.
Singer at 2 ft.

no blub-

c) SAME AS a.
Singer at 10 ft.

no blub -

EXP. XXII

RECORDER TEST
of # 66

Recorder # 51 (standard)
Singer at 6 ft

Recorder # 66
Singer at 6 ft

Recorder # 66
Singer at 2 ft

Recorder # 66
Singer at 10 ft

EXP XXIII

TEST OF RECORDERS

Recorder # 51 @ 2 ft

100% Loud
100 Quality

Recorder # 51 @ 10 ft

~~100% Loud~~
~~100 Quality~~ do

Recorder # 65 @ 2 ft

105 Loud
95 Qual -

Recorder # 65 @ 10 ft

do

Recorder # 66 @ 2 ft

Loudness 80
Clean - Quality 105

Recorder # 66 @ 10 ft

do

Recorder #70 @ 2 ft
Loud 94
Quality 95

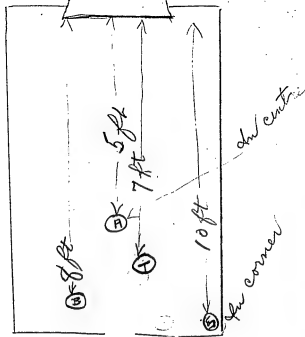
Recorder #70 @ 10 ft
do

Recorder #73 @ 2 ft
(This recorder has large cork)
Loud 95
Quality 90

Recorder #73 @ 10 ft
do

EXP ~~XXXX~~ QUARTET

Recorder 51
Position A

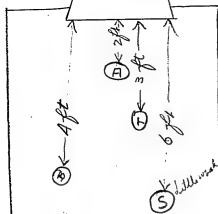


Position A

See Next Page
Edison Thought Pos B - the best
Mr Poe C next and Pos A the worst.
but thought all were
"Fairly Good"

XXX Expt

Recorder 51
Position B



Pretty good
& nearly closed
enough. Excess water
separate
no ceiling
Doubtless
some water in

POSITION B

See Opposite Page
and also Next Page

Recorder 51
Position C



done enough but
not so good as
XXX - previous

Position C

EXP XXV
RECORDER TEST

Recorder # 51

100 loud
100 Qual

Recorder # 57

110 loud
115 Qual

Recorder # 73

Bluto

Recorder # 70

Bluto - loud 80

Recorder # 55

Qual 75
loud 80

#54

Low 80

Quality 75

Mr Edison thinks #54 the
"best yet" and orders it to
replace #51 as standard

Exp XXVI
Recorder Test

Sang as loud as she
could head in horn
only jumped out a
little & scarcely
noticed it in
hearing but
shows in microns

Recorder # 57

54 best yet

Recorder # 54

Tracked too deep on its own and
scratches -

Recorder # 70

loud 90

Amplitude 80

Recorder # 55

loud 75

Amplitude 70

Recorder # 73

Scratches

Recorder # 66

Nearly as good as 57
but little scratching

#57

10ft. Blubs —
100% loud — need tighter

#65

90% Vol —
analog 100

#75

Blubs
90 loud —

EXP ~~XXVII~~

RECORDER TEST

Carry Me Back to Old Virginia

Dec 9/15

Booth rebuilt today, to eliminate all cracks and leaks where tone might escape from booth. Beret also placed on roof of booth, replacing mats which heretofore been stretched across top to form roof. Size of booth remains 9' x 12', and position of piano horn etc remain the same.

#2 horn with large brass flange which has been used exclusively in all experiments since EXP ~~XXII~~ and continues to be so used.

Recorder # 57

Reg

Recorder # 76

110 loud but scratchy + ng

10 ft 110, scratchy ng
must get out scratchy tracks

Recorder # 79

90 loud

120 loudly no double
waves as in all others
including 51-57

EXP XXVIII
RECORDER TEST

Dec 10/15

Recorder #57

100% (Low)
100 Amplitude

Recorder # 76
(Tightened)

Blubs at 2 ft -
105 at 10 ft heard 105

Recorder # 79
(Tightened)

Low 75
Amplitude 75

Recorder # 74
Low 80 -
Quality 70

Exp XXIX

RECORDER TEST

Dec 11/15

Recorder #57

Recorder #74

N. S.

Recorder #76

Has squeak

Recorder #79

About equals 57

John Ott Recorder

A Little Better than 77

EXP XXX

Recorder Test

Erving Star
E.R. Dawson

Dec 14/15

1 1/2

Recorder #57



6 ft

100 low

ad info point (corrected)
only 1 sample taken

Piano ok 10 ft balanced ok in practice 7 ft or 6 ft
will give record as below as usual 8 ft or ok

0015

Recorder # 74

(Surface)

75 low scratches

0025

Recorder # 76

90 low

Recorder # 77

95 low

Dec 14, 1915.

Recording Outfit moved from laboratory to #4 building, where booth similar to the one before used has been constructed, a little more substantially built however.

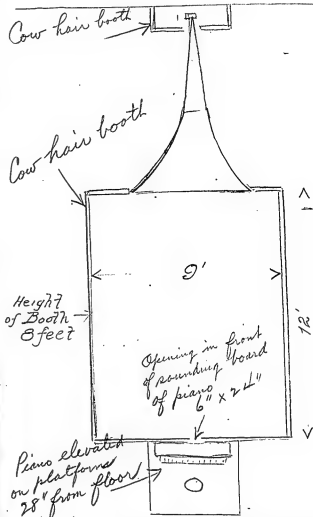
The height of the booth has been raised a foot to accommodate the new horn which is larger than the last one but of like shape and material.

Booth of padded screens is now built around the recording machine $3' \times 7'$. A screen also laid across the top forming padded roof.

Cow hair matting is laid on floor as before.

Horn is suspended from a timber frame by a rod on ball bearings.

Exp ~~XXX~~ was made under these conditions.



EXP ~~XXXI~~
RECORDER TEST

Dec 15/15

Last Rec of Summer
Mrs. Ayers

Wednesday
65 noon at wind -

Recorder # 57

1 1/2/1000 - Large jar stirred -

Strained -

Low 100 quality 100

Recorder # 65

Diaphragm 1 1/2" x .0015"

Aluminum Disc

Disc

Low 120

110

Disc

Quality at 2 ft much better than 57

Recorder # 75

Diaphragm 1 1/2" x .0015"

Aluminum Disc

Disc

110

105

Recorder # 77

Diaphragm 1 1/2" x .0015"

at disc

Disc

95

95

Scratched

Recorder # 78

Diaphragm 1 1/2" x .0015"

at disc

Disc

75

100

45 is considerable more than
advertisers than 5% but
on calls at 5% ^{the amount}
~~Plotted twice~~ ^{in slot in}
from 1970

EXP. ~~XXXII~~

TEST OF SILK CURTAIN
OVER FRONT OF HORN

Dec 14/15

Curtain of Silk stretched
across booth in front of
horn

WITHOUT SILK

At 2 feet
At 10 feet
Piano

WITH SILK

At 2 feet
At 10 feet
Piano

Silk did not
make any difference

EXP ~~XXXIII~~

RECORDER TEST

Dec 16/15

Recorder # 65

Di. $\frac{15}{16}$ " $\times .001$ " Recorder # 77 65B $\frac{1}{1000}$

Too thin dia
not clear -

Di. $\frac{15}{16}$ " $\times .001$ " Recorder # 78 65B
Recap
 $\frac{1}{2}$ load of 77 -
seriously tracking

Di. $\frac{15}{16}$ " $\times .001$ " Mica Recorder # 79
Load 80
Amately poor

EXP XXXIX

TEST OF CHIMES

Dec 16/15

CHIMES #65
AT 2 FEET

Swell is continuous & not good

No Club

OK

CHIMES
AT 8 FEET #69

No Club or

Swell is very much less &
don't catch much
should be 10 ft or more

EXP. XXXY

Test of 65 Model Records

Dec 17/15

#65

100 (and)

Quality 90

#65A (54)

90 (and)

100 quality

#65B (74)

Low 40

These records were
all shot by playing
a tube within 2 ft -

EXP ~~XXXVI~~

Quartet Dec 17/15

Pos A Recorder #57

Too close to
Storm

Pos A Recorder #45

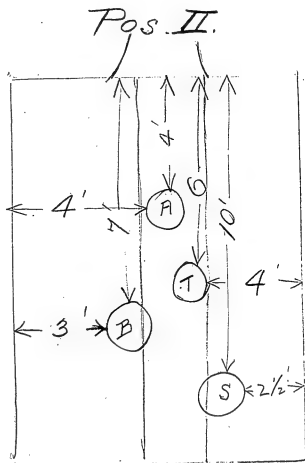
More sensitive
than 57 but
The Edison says
use 57 today

Pos I



Very Much Better.
 Pretty good in fact

Record for Blue Amberol
 made in this position.

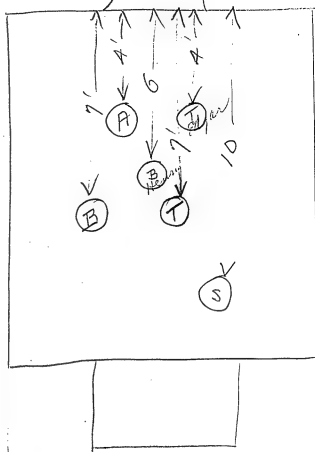


EXP XXXVII

SEXTET

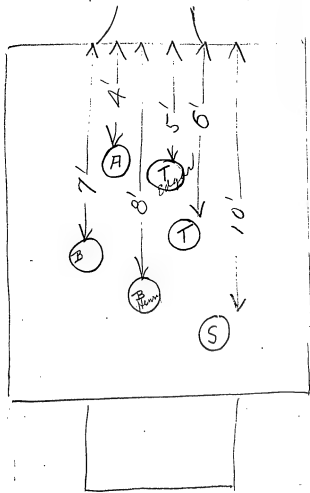
Out of Balance
Henry too loud

Pos I



Balance Better
but not right yet

Pos II.



EXP. ~~XXXVIII~~

RECORDER TEST

Dec 15/15

Evening Star
Denver

RECORDER 57

100 L
100 dual

Recorder A 65

100 loud
100 dual - Semich

Bud-

Recorder. A 66

80 loud 2 ft
at 10 ft 100 loud

Recorder B 69

100 hand at 10 ft
90 at 2 ft.

Recorder # B 73

Scratches
much

Recorder # B 77

at 2 ft 110

at 10 ft 75

No scratch -

Recorder #57

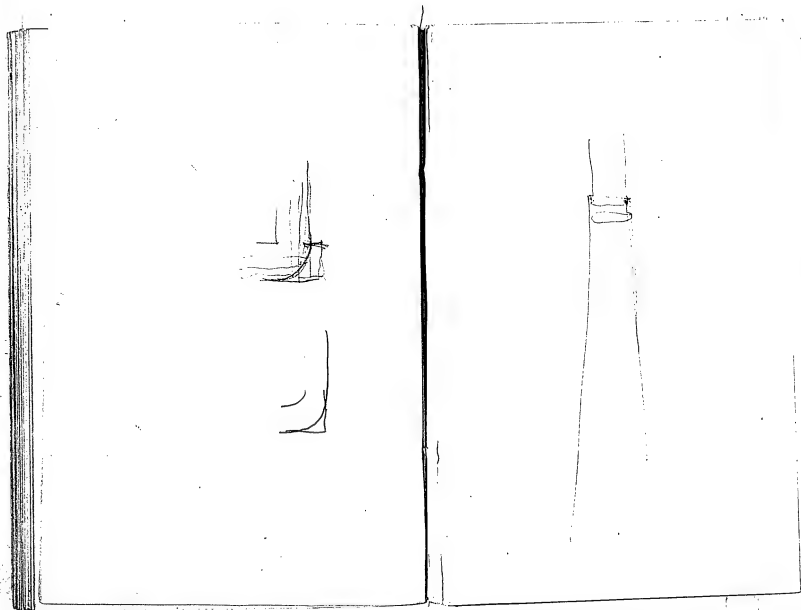
Standard

Recorder #78
Celluloid Diaphragm

Recorder #73
Fish Bladder Diaphragm

EXP XXXIX

JOHN OTT Recorder



**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-16-07-03.2**

This notebook was used during July -October 1916 and January-May 1921 by Edison, Absalom M. Kennedy, George J. Werner, and possibly other experimenters for notes on experimental recordings. In the first part of the book, details of recording sessions from 1916 are provided by Kennedy and Werner. Some of these entries contain comments by Edison, while others mention Edison's verbal remarks or instructions. This section ends with an undated note from Edison to Walter H. Miller, head of the Recording Division. The second part of the book, containing entries by Werner from 1921, begins with the title page: "Record of Recorders for Columbia St. Studio." Included are detailed drawings of numbered recorders, along with notes indicating verbal comments by Edison. Inserted into the book are notes from 1914-1916, some by employee F. C. Burt, which were apparently removed from one or several notebooks, along with additional items from 1921. The front cover is labeled "Record of Recorders For Columbia St. Studio. G.J. Werner." The book contains approximately 50 unnumbered pages followed by 60 numbered pages. At least one page was removed from the book before the pages were numbered.

Victor Teste

87150
Home Co.,
MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

7/3/16

- C1- Large sheet horn compared
with cast horn.
Recorders 109 & 121.
Violin solo
Distance 12" in each case.
- C2- Large sheet compared with cast
horn.
Rec. 132 & 122.
Violin solo.
- C3- Large compared with cast.
Rec. 130 & 108
Violin solo.
- C4- Comparing back & front of
violin towards cast horn.
(1) at 18"
(2) " 36"
Rec. 109
- C5- (1) Comparison of front & back
of violin at 5 ft. from Cast Horn.
Rec. 109.
(2) Comp. of violin at 6 ft. from Cast
horn & at 1 ft. from large horn.
Rec. 109

7/7/16.

C6 - Recorders 130-100-118.

Test of Piano & Violin solos.
Large Horn

C7 - Recorders 108-132-129-
103.

Test - Piano & Violin solos.
Large horn

C8 - Recorder 123

Test - Piano & Violin solos.
Large Horn.

C9 - Recorder Test — 7/12/16.

132-100-129-103
Large Horn

~~CT0~~ Recorder Tests — 7/12/16.

108-130-127-123-104-118.
Large Horn.

~~CH~~ Recorder tests. 7/12/16

117-115-107
Large Horn.

~~CT2~~ Recorder tests 7/14/16
132-134-120-107-
Large Horn

~~CT5~~ Recorder tests 7/18/16

132-131-102-134-109-121
Large horn.

~~CT7~~ Recorder tests 7/18/16

113

Large horn

~~C15~~ Recorder tests 7/20/16
132
126-128-106
Large horn.

~~C16~~ Recorder tests - piano 7/22/16
Std. 63-

~~C17~~ R. tests - piano
R. 132-128-126

~~C18~~ R. tests - piano
R. 113-121-106

~~C19~~ R. tests - piano -
R. 105-130-129

(C20)

Recreation! ^{7/2/16} ~~disc~~ ^{disc}
disc

R. 132-122-117-110

✓C24 Recorder with ^{disc} ~~disc~~ ^{disc}
disc

C22 Recorder tests - piano

R. 132-131-127-123-104-127

7/28/16

C23 - Recorder tests - piano

R-130-102-117-120-118-134

7/28/16.

~~Cat~~ Recorder tests - piano.

R. 113-107-128-105-105-126
7/28/10

~~Cat~~ Recorder tests - piano

R. 130-129-109-103-101-105
7/28/10

~~Cat~~ Recorder tests - piano

R. 110-122-114
7/28/10

~~Cat~~ Rec. tests - player piano

132-120-118-105-100-123

~~Cat~~ Rec. tests - player piano

132-102-103-127-131-104-107

~~Cat~~ Rec. tests - player piano

132-106-122-110-125

~~30~~ Rec. tests - player piano

132-129-130-117-115

~~31~~ Rec. tests - player

132-113-126-122-103-109

~~32~~ Harm. tests - with & without reflector

Rec. 113

~~33~~ Test with & without reflectors.

Violin at 11°.

~~34~~ Recorder tests - piano

100-102-103-104-105-106

~~35~~ Recorder tests - piano

128-129-130-131-132-50

~~36~~ Recorder tests - piano

107-108-109-110-113-114-115

37. Accordion tets - piano

117-118-120-121-122-126-127

38. Accordion tets - violin

113-114-115-116-107-108

39. Accordion tets - violin

120-121-122-126-127-128-129

40. Accordion - violin

131-131-132-50

41. Acc. tets - violin

113-114-113-114-115-117-118

42. Acc. p. large & small horn - violin

Sept 22/16

43. Piano with Player attachment
To determine opening of
piano.

12' distant Opening: 1 panel wide

① - 1' wide

② - 3" "

③ - 5" "

④ - 7" "

⑤ - 9" "

⑥ - 11" "

⑦ - 13" "

⑧ - 15" "

⑨ - 17" "

⑩ - 21" "

⑪ - 25" "

⑫ - 29" "

⑬ - 33" "

⑭ - 41" "

⑮ - 46" "

12' Distant Opening 3 panels wide

① - 1" wide

② - 3" "

③ - 5" "

④ - 7" "

⑤ - 11" "

⑥ - 15" "

⑦ - 19" "

⑧ - 23" "

⑨ - 30" "

⑩ - 40" "

(47) - Piano 6' distant, opening 1 panel

- ① - 1"
- ② - 3"
- ③ - 5"
- ④ - 7"
- ⑤ - 9"
- ⑥ - 11"
- ⑦ - 13"
- ⑧ - 15"
- ⑨ - 17"
- ⑩ - 19"
- ⑪ - 21"
- ⑫ - 23"
- ⑬ - 25"
- ⑭ - 27"
- ⑮ - 29"
- ⑯ - 31"
- ⑰ - 33"
- ⑱ - 35"
- ⑲ - 37"
- ⑳ - 39"
- ㉑ - 41"
- ㉒ - 43"
- ㉓ - 45"
- ㉔ - 47"
- ㉕ - 49"
- ㉖ - 51"
- ㉗ - 53"
- ㉘ - 55"
- ㉙ - 57"
- ㉚ - 59"
- ㉛ - 61"
- ㉜ - 63"
- ㉝ - 65"
- ㉞ - 67"
- ㉟ - 69"
- ㊱ - 71"
- ㊲ - 73"
- ㊳ - 75"
- ㊴ - 77"
- ㊵ - 79"
- ㊶ - 81"
- ㊷ - 83"
- ㊸ - 85"
- ㊹ - 87"
- ㊺ - 89"
- ㊻ - 91"
- ㊼ - 93"
- ㊽ - 95"
- ㊾ - 97"
- ㊿ - 99"

6' 5" and 3' 5" distant

(48) - Experiment with $\frac{1}{4}$ " recorders
 ① - Rec. 1 } Player Piano
 ② - " 0 } at 6' 12"-7"
 1 panel opening.

(49) - Experiment with $\frac{1}{4}$ " recorder
 1 panel wide
 30" opening at 6'

(47) - Exper. with $\frac{1}{4}$ " recorder
 1 panel wide, 7" high
 recorder 0

(47) - Rec. 2
 Piano. Large horn. Large trumpet.
 Viola " " " "
 Piano. Large " Small "
 Violin. " " " "

H-1 Hawaiian Gutter Rust.

Elles March

Cygnus Kincaid and Robert Maialeale

R-126-10/20/16.

Hawaiian Gutter - 5 ft. from stern (1-3)

With harmonium reflector
over head.

Gutter

10 ft. from stern (7-8)

Time: O.K.

(verbally m.m. E)

A-2 - Mauna Kea
 Paritone Solo by ^{Mr} Rinsaku
 Accompanied by Ford Hawaiian Quartette
 R 128 - 10-30-16

1st Bass & Hawaiian Steel Guitar - off from horn	①
Paritone & Guitar	6" " " ⑤
Mr. Bass & Ukulele	9" " " ②
Drums & Guitar	5" " " ④

OK 749

H-3 - Tami-Tami.
R 130 - 18/00/16.

1st Bers & Haw, St, Qutar	- 5 ft from horn	①
Bartone & Qutar	- 6 " " "	②
Mrs Bass & Eupalele	- 9 " " "	③
Tenn & Qutar	- 5 " " "	④

H-4 On the Beach at Mai-ki-ki
R130 - 10/20/16.

Mr. Bass & Steel Guitar.	off from horn	(1-2)
Guitar & Soloist	4" " "	(2)
Guitar & Tenor	10" " "	(7)
Ukulele & Bass	10" " "	(8)

No - Rag American
type not wanted
want soft slow
Hawaiian or plaintive
Music —



H-5 Pukohana Naitz
Instrumental

R126- 10/28/16.

Steel Guitar 7ft from horn with retractor ①

1 Guitar 8'

2 " 8'

Amboalele 10'

(5-2)

(6-1)

(8)

OK -

Naitz Base & high
Base is strong and
high weak just as
all music should
be & just opposite
in our second

H-6 The Rosary
Hawaiian ~~the~~ Kuler Sold
By Robert Maasaleale
R/26 - 10/20/16

NO

2ft from horn #2

H-7 ~~Shed~~ Plantation

R. 130

ms Bars & Steel Quiter - 2' ①

at base of kelly - 3' from horn ②

7' " " ③

Penon Quiter 7' " " ④-⑤

Carolina Quiter 7' " " ⑥-⑦

Solo Position

Quartette Position

no

H-8

- C & P.

No

Steel Guitar -	3'	(1-2)
Guitar & Banjo	7'	(5)
Guitar & Banjo	10'	(7)
Ukulele & Bass	14'	(26)

H-9

Kaena

tenor too strong

Tune ok -

R/30 - 10/21/16

Phil Guntar 8'

Guntar & Guntar 6'

(15)

(6)

H-10^a

ala. Ha. @

good -

one singer too strong

Ala. Ha. @

Rich Harmonium

This is much better
than the first principally
because positions of
ringers better

Still better than 2 ft 10

Exhale 15' ②

2 ft 10 at ③ ④ - Harmonium 10' at ⑦

H-11

Ka-Masli

NO-but might be
got or —

Bartone at Colebrook
too low.

H-12

Ka - Masli

R130 - 10/23/16

Steel Guitar & Bass 3'-
Guitar & Tenor 6'-
Guitar & Banjo 10'-
Empalme & Bass 18'-

③

⑥

⑦

⑧

No

A-13-1

Kuw - Ipo (my sweetheart)

R130 - 10/23/16.

Soloist & Guitar	7'	⑤
Mt. Bass & Steel Guitar	3'	③
Tenor & Guitar	6'	⑥
Bass & Ukulele	10'	⑧

fair -

N-13-1

F

Kuw - Spo (My Sweetheart)

R/30 - 10/23/16 -

Soloist Guitar 10'
Steel Guitar & Bass 3'
Tenor & Guitar - 6'
Euphone & Bass - 10'

⑦
③
⑥
⑧

N-14.-1

Kilima Mochy - Instrumental

R126 -

10/23/16 -

Steel Guitar 3'
Guitar #1 10'
Guitar #2 10'
Eukalele 20'

(9)

(8)

(7)

(22)

OK

H-14-2

Kilima Maltz

R126 -

10/23/6

Steel Guitar 3'

Guitar #1 10'

" #2 10'

Euphone 15'

③

②

⑦

(26-28)

H-15-1-

Kahokuhale Song

^{Arranged 7-6}
R 130 -

10/23/6.

Tenor & Guitar	7'	⑥
Baritone & Guitar	10'	⑦
Mr. Bass & S. Guitar	3'	③
Bass x Ukulele	10'	②④

H-15-2

Kahokuhele

Sk. Kuitau & Mo Bass
Kuitau & Tenor
Baritone & Kuitau
Eukalake & Bass

3'
7'
9'
9'

③
④
⑦
②①

No

H-16-1 you-know-beautiful

Nehi - Nehi - Oe

R-130 - 10/22/16.

Steel Guitar, one Bass

3'

③

Guitar & Tenor (soloist)

8'

⑥

Guitar & Banjo

10'

⑦

Eukalele & Bass

9'

⑧

H-16-2

Nehi-Nehi-Oe

R/30 - 10/23/16.

Steel Guitar w/mt Bass 3' - ③
Guitar Tenor Banjo (Steps forward on scale) 9' ⑥
Guitar & Banjo (Steps fold on low notes) 9' ⑤
Euphonio & Bass 9' ②②

H-16-3

Mehi-Mehi - Oe
R130 - 10/23/16.

Steel Guitar & snr Bass	3	5
Guitar Tenor	8	6
Baritone & Guitar	10	7
Bass Ukulele	10	8

OK & think but all
blubbered up in
Chorus

Chorus rattle all
out of time & out of
time with their own
melodies = If Tenor
alone sings without Chorus
it will be OK

A-17-1

R130 - Onana
10/23/16.

Steel Guitar and Bass	3'	③
Acobalele and Bass	10'	⑧
Guitar and Baritone (Solo)	10'	⑦
Guitar and Tenor	7'	⑥

H-17-2

Anaona

R 120 - 10/28/16.

Steel Guitar & Bass	3'	③
Baritone & Guitar (Solo)	10'	⑦
Tenor & Guitar	7'	⑥
Bass & Euphonium	15'	⑩

OK -

N-18-1

Ahahi - Hoi (Louchut thec)

R 130 - 10/23/16

Tenor & Guitars (Solo)

8'

⑥

Baritone & Guitars

15'

⑦

Bass & Eubalele

15'

⑧

1st Bass & S. Guitars

3'

③

OK —

N-19-1

Kaala

R130 - 10/23/6.

Baritone & Sitar (Solo)
Tenor & Sitar
2nd Bass & 2nd Sitar
Bass & Ukulele

12'
8'
3'
15'

⑦
⑥
③
⑩

OK -

N-20-1

Kahinano
R130 — 10/23/06.

Tenore Guitan (Solo)	8'	(6)
Baritone Guitan	15'	(9)
Bass & Ukulele	15'	(10)
2nd " 2nd Guitan	3'	(3)

OK

H-21-1

Mili-Mili-Mai
R/30

Bass & Guitar (Solo)	7'
Tenor (Saxophone) & Trumpet	9'
Tenor & Euphonium	15'
Bass & St. Guitar	3

5
6-8
12
3

NO

A-22-1

Makahana

R130 - 10/23/10

Tenor & Solo Quintet 7'
Baritone & Quintet 15'
Bass & Ukulele 15'
Bass & Steel Quintet 3'

6
9
10
3

OK -

H-23-1

Kohala Marsh -
R126 - 10/23/16

Steel Guitar
Guitar

3'
10'

③
⑥

OK

H-24-1

Maid of Stanoluna

R-130 - 10/23/16

Steel Hunter Penn	3'	(3)
Berstone Hunter (Solo)	14'	(9)
Ross & Eukale	15'	(10)
Town (Paletto) Hunter	18'	(27)

No -

Walter Miller -

Look out for the Baritone
he is entirely too loud
& the tenor is weak. →

We placed him 15 ft away
& the tenor 3 ft & 1/2 ft
Baritone is too loud
tell him to sing $\frac{1}{2}$ volume

They interfere badly in
Chorus & the Chorus is
apt to be too loud
take Chorus weaker

Σ

RECORD OF
RECORDERS
for
COLUMBIA ST. STUDIO.

$\frac{1}{8}$ " DIAPHRAGMS.

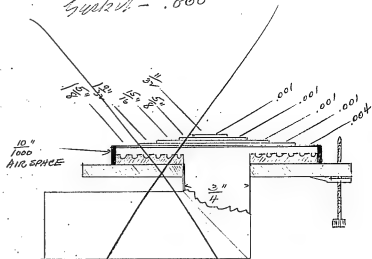
$\frac{3}{4}$ " OPENINGS.

DIAPHRAGM NO. 1.
RECORDED

June 9/2, Hill # 43

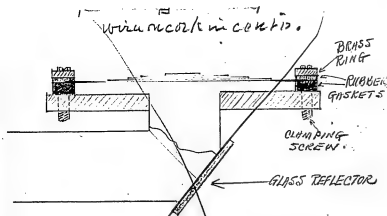
 $2\frac{1}{2} \cdot 4 = 10$
$$1\frac{5}{8} \quad 1\frac{7}{8} \quad 1\frac{1}{8} \quad \frac{7}{8}$$

Lyukin - .060



THIS INSERTED IN
AIR SPACE WITH GASKET ON EDGE.
 $\frac{3}{4}$ OPENING - $\frac{1}{8}$ " DIAPHRAGM.
GASKET ON EDGE .0725

DIAPHRAGM NO. 2
RECORDER



DIAPHRAGM = 5-5-13 $\frac{1}{2}$ -16-18^{#2} THICKNESS
1000

DIAMETERS OF LAYERS = 1 $\frac{5}{8}$ " 1 $\frac{3}{32}$ " 1 $\frac{5}{8}$ " 1 $\frac{5}{8}$ " 1 $\frac{11}{32}$ "

RUBBER GASKETS = LOWER 51 $\frac{1}{1000}$ " THICK, UPPER 38 $\frac{1}{1000}$ " THICK
1 $\frac{1}{2}$ " INSIDE, 1 $\frac{3}{8}$ " OUTSIDE, $\frac{3}{16}$ " WIDE.

BRASS RING FOR CLAMPING = 9 SCREW HOLES.
1 $\frac{1}{2}$ " INSIDE, 1 $\frac{3}{8}$ " OUTSIDE, $\frac{1}{32}$ " THICK -

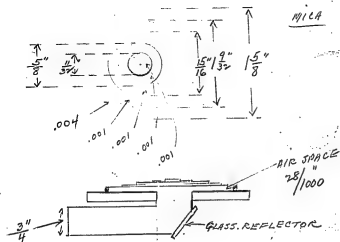
Recorder #2.

MAY 5 1921

Paper film. Same as in page 3
Broken screw as before
Spring same as #7.

5

DIAPHRAGM NO. 3.
RECORDER



6

7.

DIAPYCNEM NO. 4.
REORDER

8

DIAPHRAGM NO. 5.
RECORDED

11.

DIAPHRAGM NO. 6,
RECORDER

2/21

NICH DIA = 4-1-1-1-1 THOUSANDTHS.
GASKET = $\frac{.88}{1000}$ " THICK $\frac{3}{32}$ " WIDE

W/TH WINDS CONTROL -

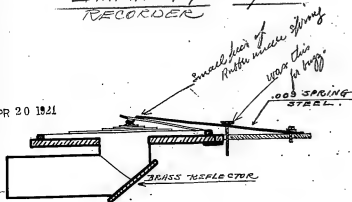
12

25
1000
1000

13

DIAPHRAGM NO. 7. RECORDER

APR 20 1921

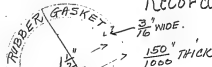


DIAPHRAGM IN ABOVE RECORDER IS PAPER
 DIAMETERS OF LAMINATIONS = $1\frac{1}{8}$ " $1\frac{3}{8}$ " $1\frac{1}{2}$ " $\frac{5}{8}$ " $\frac{1}{2}$ "
 THICKNESS OF " = .006".007".008".009".010".
 " " Gasket - $5\frac{1}{16}$ " - Width $3\frac{1}{8}$ "

Makes a loud free tone record and holds
 very good M.E. says shows good overtones on
 base. will try same thing with Mica Dia. to see
 if it is quicker. M.E. says Monica.

2/6 2 14

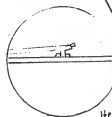
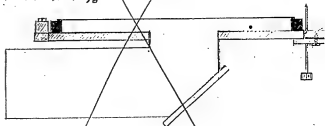
Recorder #7.



DIAPHRAGM = PAPER

6-8-14-16-19-"
1000

WITH WIRE CONTROLL IN CENTER ONLY -
 REGULAR ARM $3\frac{1}{8}$ " D.F.H.

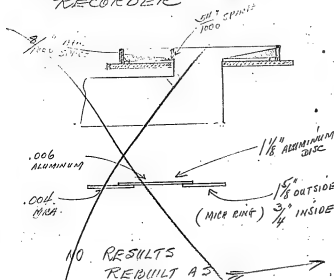


Match String
 $\frac{3}{32}$ " Wide .004" Thick.

Heated and layered on Dia.
 under both in line with
 head of Arm.

15

DIAPHRAGM NO. 8. RECORDER

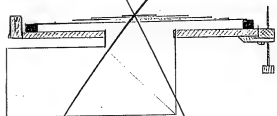


See page 16

RECORDER #8

PRESSED PAPER DIA. #5

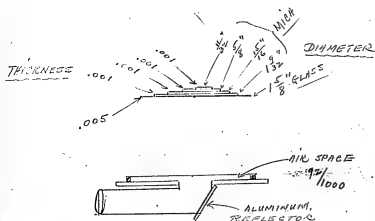
DIAMETERS: $1\frac{5}{8}$, $1\frac{9}{16}$, $1\frac{15}{16}$, $1\frac{5}{8}$, $1\frac{11}{16}$
 THICKNESS: $1\frac{3}{4}$, $1\frac{7}{8}$, $1\frac{14}{16}$, $1\frac{16}{16}$, $1\frac{17}{16}$
 1000



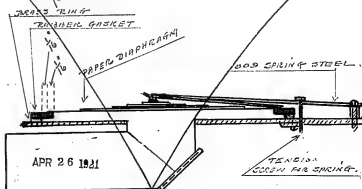
Cork in Centre on foot.

See Page 18

DIAPHRAGM NO. 9 RECORDER



Recorder #8.



AIR SPACE .069"
 RING = 2" OUTSIDE DIA. 1 3/4" INSIDE DIA. .031 THICK
 RUBBER GASKET = 1 3/8" OUTSIDE DIA. 1 1/2" INSIDE DIA. .038 THICK
 PAPER DIAPHRAGM = 1 5/8" OUTSIDE DIA. (THICKNESS 7-8 1/2-11 1/2-14-16 1/2)
 OVER HANG = 1/2" OF GASKET. 1/2" OF DIAPHRAGM.

Overhang is made Rec'd full and soggy back
 no more. Cut out overhang in spring.

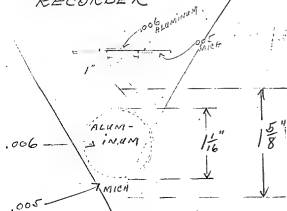
Rebuilt as above without overhang.

Notes die No. 4

Paper Dia. 6-7-8-9-10

Rebuilt - 5 1/2" dia. 1 3/8" dia. 1 1/2" dia. 1 3/4" dia.

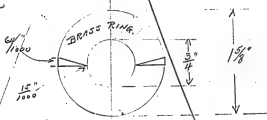
DIAPHRAGM NO. 10. RECORDER



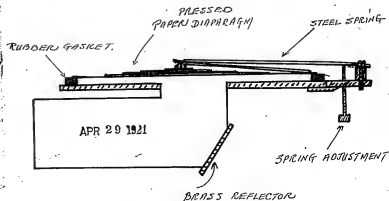
.030
AIR SPACE
OUTSIDE EDGE

.074
MAXIMUM AIR
SPACE CENTER

RUBBER
GASKET
9 1/16" x 1/16" x 1/16"
WIDTH THICK



RECORDING DIAPHRAGM NO. 10.



PAPER DIAPHRAGM.

DIAMETERS OF LAMINATIONS $1 \frac{1}{8}$ " $1 \frac{3}{32}$ " $1 \frac{5}{16}$ " $1 \frac{5}{8}$ " $1 \frac{3}{4}$ "

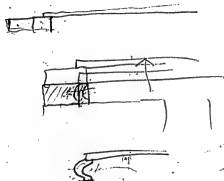
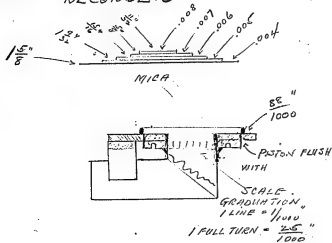
THICKNESS " .0075 " .007 " .007 " .007 " .007 "

RUBBER GASKET = .053" THICK $\frac{3}{16}$ " WIDE.

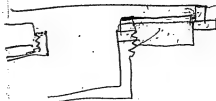
AIR SPACE = .053"

23

PISTON DIAPHRAGM NO. 12, RECORDER

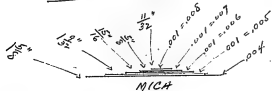


24

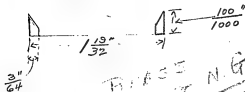


25

PISTON RECORDER NO. 13.



SAME FORM AS NO. 12
BUILT UP WITH BRASS KNIFE EDGE RING
INSTEAD OF RUBBER GASKET.



FULL AIR SPACE = $\frac{100}{1000}$ "

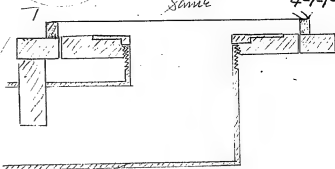
NICK DIA. WAXED ONTO KNIFE EDGE.

26

NO. 13. Rtn.



DIA = SAME AS
OPPOSITE PAGE 4 + 4003
Made 5 trials with the gasket
3/1000 6/1000 3/1000 25/1000 15/1000
Best Trials #1
Same 4-1-1-1-1



Tryed this above with 3-1-1-1-1
Nick dia - blutbrun kumseh 4/8.

NO 13. How.

28



$\frac{3}{16}$ " WIDE
 $\frac{55}{1000}$ " THICK OR HIGH.

DIT. SPACES 15
 ON PAGE 25, + 26

Made 5 trials with this gasket. Trial #3
 $5\frac{1}{1000}$ - $6\frac{3}{1000}$ - $35\frac{1}{1000}$ - $24\frac{1}{1000}$ - $18\frac{1}{1000}$
 Best

Mr Edison compared this Gasket $\frac{3}{16}$ "

Tryd same as above only $\frac{1}{2}$ hole in plate
 instead of $\frac{3}{4}$

Inclusion Seal N 6.

air space

$5\frac{1}{1000}$ $6\frac{3}{1000}$ $35\frac{1}{1000}$ $24\frac{1}{1000}$ $18\frac{1}{1000}$



Trials #5.

RUBBER GASKET

← $\frac{1}{4}$ " WIDE

$\frac{80}{1000}$ " THICK OR
HIGH.

DIM. SAME AS USED
ON PAGE 25-26-28

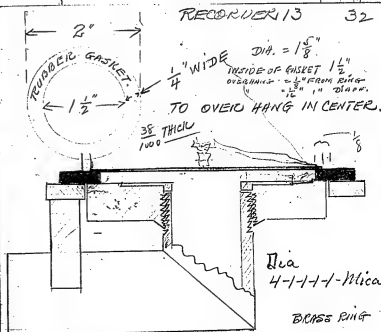
Made 5 trials with this gasket

$\frac{80}{1000}$	$\frac{63}{1000}$	$\frac{35}{1000}$	$\frac{28}{1000}$	$\frac{18}{1000}$	Trials #4.
-------------------	-------------------	-------------------	-------------------	-------------------	------------

best,

31

RECOVER 13 32



Trials #6.

5 Trials Air Space.

69/100 59/100 49/100 39/100

trial



RECORDER #12 34
 PRESSED PAPER
 DIAPHERG.

1000 $\frac{1}{1000}$ thick \rightarrow 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 \leftarrow diameter in inches

TRIALS #7

55/1000 63/1000 38/1000 25/1000 18/1000
 AIR SPACE \rightarrow back \rightarrow

RUBBER GASKET \leftarrow 3" WIDE
 \leftarrow 1 1/2" \rightarrow 85" THICK
 1000

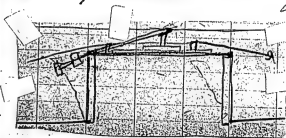
Record #13 built same as on Page 32

Made trials with and without wire control.

Trials #8
Trials Wot-2- $39/1000$ $49/1000$ without wire

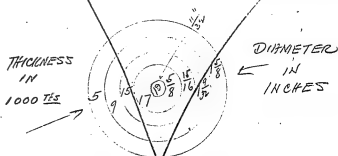
Trials #9
" " 3-4- $39/1000$ $49/1000$ with wire

Wire control much better than without
for bluffs. Mr. Edison agrees on this
but wants further on size of blade and
trial to get some results.



36 37

RECORDER #12
PAPER DIAPHRAGM.



Tricks #10

1st	Air Space	84/1000
2	"	" 763/1000
3	"	" 436/1000
4	"	" 28/1000
5	"	" 16/1000

All very good Mr. E. says.

38

38 39

40

RECORDER #13-

BUILT SAME AS OVERHAUL ON PAGE 32.

WITH NEEDLE ARC LOWERED TO $\frac{3}{32}$ " INSTEAD
OF $\frac{3}{16}$ " AS SHOWN.

TRIALS #11

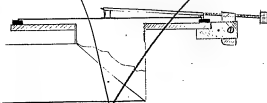
10	1° Trial	Pin Place	59/1000
	"	"	49/1500

Holds better than high arm.
W.

35 41

42

RECORDER NO. 1.

ADJUSTABLE STAY AT NEEDLE
ARM END.GASKET $\frac{3}{16}$ " WIDE, $\frac{38}{1000}$ " THICK.

DIAPHRAGM	.004	.001	.001	.001	.001	MICA	LAYERS
DIAMETERS	$1\frac{1}{8}$ "	$1\frac{1}{2}$ "	$\frac{15}{16}$ "	$\frac{5}{8}$ "	$\frac{11}{32}$ "		

TRIALS #12

Used Trials #13 instead of paper film.

NG.

RECORDER NO. 1.

Same as on page 42

GASLET - $\frac{1}{4}$ " WIDE $\frac{80}{1000}$ " THICK

DIMENSIONS - 15" - 1 1/2" - 15" - 5" - 11"

DIAMETERS - 15" - 1 1/2" - 15" - 5" - 11"

THICKNESSES - .008" - .011" - .012" - .014" - .015"

OTHER KNOWN DIMS AS ON PAGE 42.

TRAIL = $\frac{1}{13}$. Jan 2/21

1st Trial

Thia, 7/14

2nd " 58% done and with birds
and 8X. Mr Edison says3rd. " Weak & thin with stay at end of
Mr Edison arm.4th " 1/2. " " " 1/2 between
mouth.

RECORDER #13

PRESSED PAPER DIA.

8-10-14-16- - THOUSANDTHS

REG ARM = $\frac{3}{16}$ "

RUBBED GUNNET OVER HANG CAME 3V

Trials #14

1st Trial - Gun Space 69/1000

2 " " " 59/1000

Weak.

RECORDER #7

SEE PAGE 13 -

47

Trials #15.

Recorder #1.

1st Trial Rec #1 On Spoke 30/1000

" " " " "

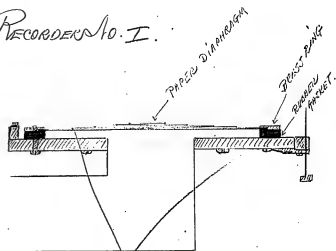
3 " Recorder #12

4 " " #7

Trials #16.

No 1-Recorder adjusted Louder. # Trial

RECORDER NO. I.

RIMMER GASKET = $\frac{58}{1000}$ " THICK $\frac{3}{16}$ " WIDE.PAPER DIA = $\frac{7-8-9-11-13}{1000}$ " THICK.BRASS RING = $1\frac{1}{2}$ " INSIDE $1\frac{3}{4}$ " OUTSIDE $\frac{3}{16}$ " WIDE.
 $\frac{45}{1000}$ " THICK 4 SCREW HOLES FOR CLAMPING.Find this to thin no overtones
See next page.

48

Recorder #1.

Rebuilt with Air Space $58/1000$

Paper dia - 3-7-10-16-16.-

 $38/1000$ Rubber gasket over dia.Clamped with brass ring sec. 48 

Dia. loose between gaskets
 to Sennar could not control it even
 with press 11 ft. away.

50

Recorder #13 Trial #77
 Overhanging Gasket.
 Built same as on page 32

only change in Dia.

Using mica for first layer then paper

4-8-11-13-15. with control1st Trial Air Space $49/1000$

2nd " " " " Less Tension

3 " " " " " "

Mr Edison says very good.

Don change the Recorder

58

#11

Trials #20

Air Space 58%₁₀₀₀

1st Trial

Rec. # 11

2 "

" # 11

3 "

Rec. # 1.

4 "

" # 1.

all Good.

Thin 5-7/16 1000-1000

Gasket 58%₁₀₀₀ 1/16 1000 98%₁₀₀₀

9 cells - Ring - Same as page 48.

7/15/20

7/15/20 OVERHANGING GASKET.

58

RECORDED NO. 2.

BRASS RING DIAPHRAGM = $\frac{5-5-13\frac{1}{2}-16-18}{1000}$ BRASS RING = $\frac{55}{1000}$ THICK $1\frac{1}{16}$ " INSIDE 2" OUTSIDEFLUOR GASKET = $\frac{75}{1000}$ THICK $1\frac{1}{16}$ " INSIDE 2" OUTSIDEOVERHANG = $\frac{3}{32}$ "

H.G.W.

55

Feb. 16/4

Recorder's #8. See page 16.

Trial's #1 - for space 4th row

" #2. " "

Trial's #21.

56

Recorder's #1-#11-#2

all clamped with Ring.

1st Trial & Rec. #2 - Page 4

2 " " #11 - Page 21

3 " " #1. Page 51

Trial's #22.

57

Feb. 23

Recorded 2. Lauterbach 7 fl.

~~7 fl.~~ open

Page 3.

Trials 23.

road or 7 fl.

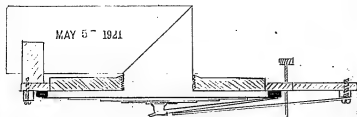
58

59

Recorder #12

May 6th 21.

ADJUSTABLE AIR SPACE.



1/8 1/6 3/8 1/2 5 8 10 11

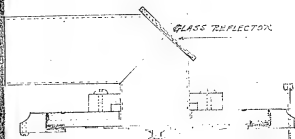
Paper No. 18 Haywards factor 85% moisture
9/16 in. 22.

With Spring same as #17.

60

RECORDER NO. 15.

CLAMPED ARRANGEMENT.



DIAMETERS 1 1/8 1 1/4 1 3/8 1 1/2 1 5/8 1 3/4 1 7/8 1 15 17 10 9 6 PLYSSE IN 12 1/2 IN. 100
PAPER DIMENSION

KUMBER GASKET

LAYER 31" APPED 55" 1000

[ITEM(S) FOUND IN BOOK]

Recorders for Weak Voices

30
.024" Use when not to be Amplified

2 - Low & full

9 - Loud as #2 - but thinner tone.

July 1/14.

Test of Recorders at 18 feet -

2 low tone

Dia. # 50 - Loud at 30 ft high in 1st slot

" 6

" 2 Wind as loud fuller tone.

" 40 " " " 50 # 50 fuller tone

" 8

" 11

" 10

" 30

" 7

all others weaker.

[ITEM(S) FOUND IN BOOK]

(163)

July 27, 1900

Room - north. 52-54. 54-56.

20 - North - 54-56. 56-58.

50 - North - 54-56.

40 - North - 54-56.

30 - North - 54-56.

20 - North - 54-56.

30 - North - 54-56.

[ITEM(S) FOUND IN BOOK]

12/17/5 to

Records

F. C. Rust.

[ITEM(S) FOUND IN BOOK]

Dec. 17-1955

Sketches Records.

73 } make up name as
77 } #65 -
69 } Stock #007, paper
Sketches #001
15 x .0015 aluminum circles.
16

Letter Dec. 18 - P.M. by Mr. Manning
Entry fair.
73 not returned for Administration.

77 } returned for Administration.
76 } (see next page for text)
69 }

[ITEM(S) FOUND IN BOOK]

Dec. 76/15-

Stretched Remains.

#77 Japanese paper -.002
etched thin shellac, then thin varnish
center aluminum 3/16 dia x .006
needle arms same size.

76. Same as 77.

not thick
~~summit or shellac~~

Stretch 1/2 28/15-

69. same as 77.

Etched 17/100s Very fine quality
but not hard enough for
S.A.G. (surface not bad).

Rebuilt

[ITEM(S) FOUND IN BOOK]

Dec. 21/15

*77 Stretched.
metallic arms changed to
standard arm from stretching.

Spelling "Pine" just preceding & leading
than day office.

One change from previous
test (circular top & rectangular
background in circular top)

*78 Personal notes & terms.

*70 Old style head.
Built up .002 inch or less
was way, 1 quarter.

Printed - Fairly good. (rough surface.)

*70 Old style -
same as above, with
aluminum center $\frac{7}{16} \times .003$.

Printed - better surface & bit longer,

*69 Stretched -
Stock Jap. Paper .0007. } N.G.
Sulphate .001.
Aluminum $\frac{15}{16} \times .0015$.

[ITEM(S) FOUND IN BOOK]

Dec 22, 1915

*105 Old Style lead

Built all way.

~~1~~ .001 inch mesh 1 gasket

.001 x $\frac{5}{16}$ aluminum center.

Tested 50% Water than - N. &.

Dec. 23. 1915

*69 (Rebuilt)

[ITEM(S) FOUND IN BOOK]

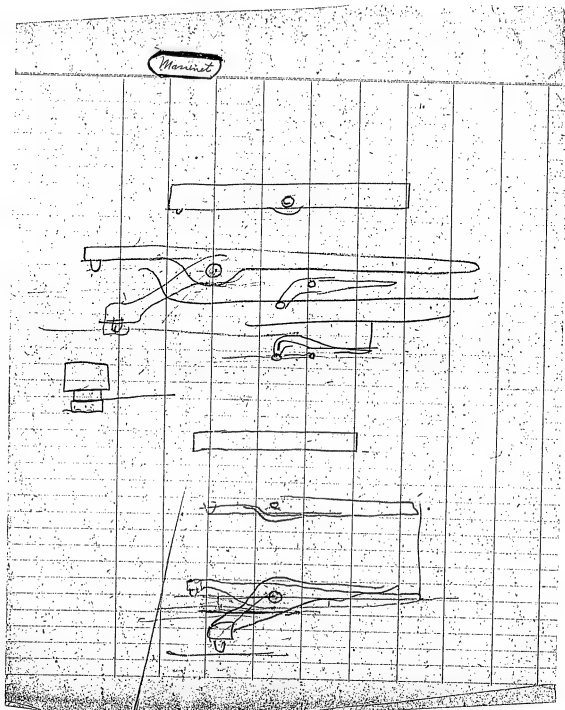
H. Lauter Feb. 23/21

Rect #6-

Horns 13 - on Ref. Plaster

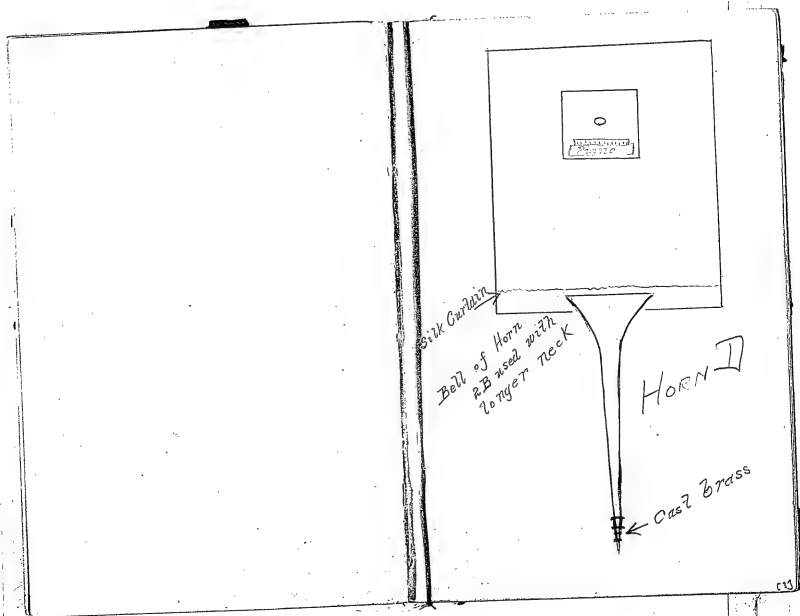
Horn on Recordings. W. W. C. 6/11.
3 1/2 in. dia.

[ITEM(S) FOUND IN BOOK]



**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-16-11-13**

This notebook was used by E. Rowland Dawson during November 1916-February 1917 for notes on experimental recordings. The entries contain details of the recording sessions, including weather conditions, and numerous entries either quote or paraphrase Edison's comments and opinions. Also included are notes relating to voice trials for a sextet to be organized to make experimental recordings. Some of Dawson's comments indicate skepticism about the usefulness of these experiments. The notes indicate that William A. Hayes and Absalom M. Kennedy worked with Dawson on some of the recordings and recorders. The second part of the book [not selected] includes a list of disc prints from August-September 1921 and entries on pianos, harps, and other musical instruments used at the recording studios from 1922 to 1925. The label on the front cover is obscured by tape. The pages are unnumbered, and several pages have been removed from the front of the book. Approximately 60 pages have been used.



Nov 13

Test of diameters of heads
using interchangeable diaph-
ragms on different heads.

The same diaphragm is used
in all three cases, as was
true in the case of being changed.

$\frac{3}{8}$ inch head much better
in quality than $\frac{1}{2}$ inch
also a trifle louder in
volume

$\frac{1}{2}$ inch not so good as $\frac{3}{8}$

Mr Edison says $\frac{3}{8}$ " is
the right one

Nov 15

Test of Mica Diaphragm
against Paper Diaphragm

Using same head for
mica diaphragm than
paper.

Mica proved better in
quality and volume.

Note. - This is now damp
day, and paper diaphragms
do not show up as well
as they did last week on
a bright day. This would
not change the verdict how-
ever. Mica is the better.

Nov 15

Test of Gaskets of Different
Thicknesses.

Using $\frac{3}{8}$ inch bore throughout
and paper diaphragm

.005" .010" .015" .020" .025" .030"
.037" .045"

.015" "the loudest".

Quality much the same, im-
proving slightly with greater
depth

Mr Edison says .020 to .030 is
best

Nov 13

Test of Effect of Temperature
upon Records

Studio was very cold and
damp and records very
weak sharp and dis-
agreeable

after heating to about
75° another record
of the same piece same
recorder and conditions
was made

Record was 75% louder
and quality much improved

Nov 14

Test of distance from Recording Horn in Booth.

Quartet sang at 3, 6, 9
12 and 20 feet.

Mr Edison says very slight
difference between 3' + 6'. To
us there was practically none

at more than six dis-
tance was noticable but
was fairly loud at 20'

Mr Edison says "I will
get the symphonies all
right." The horn seems
all right but you must
get more sensitive recorder"

Nov 15

Miss Bicknell making test
record blasted on high
notes at three feet.

At six feet record did
not blast but was just
on the verge. However
her placement was better
when singing at six feet.

#130 aluminum dome made
for the old horn proved better
than any other recorder.

Nov 16

Signor Bill Haynes joined us today, and we tried one of his receivers against our own and found recorders we now have are more sensitive than present commercial recorders. However Mr Edison says we must get one more sensitive

Nov 17

Test of wrapping horn
with cow hair:

(a) Test with both bell and
neck of horn pretty thoroughly
wrapped.

(b) With neck thoroughly
wrapped and bell free of
cow hair.

(c) With part of neck
wrappings off, leaving neck
wrapped only in spots to
break up nodes.

(d) With horn entirely
free of cow hair.

We find a more solid and clear
(d) with more of room tone about
equal in volume

Nov 18

Wrapped neck of horn
thoroughly with cow
hair even the cast
brass section.

Kept same in
this manner during
voice trials Nov 20, 21 &
22nd.

Getting new recording
and new reproducing
machines ready.

Nov 20, 21, 22

Mr Edison ordered a
sextet organized.

Called on Mr Chas. H Drake
of Wolfsohn Bureau, Mrs
Charlotte Babcock, Townsend
H Fellows, 815 Carnegie
Hall, Mr Boone of
Criterion Bureau, And
Mr Anderson and told
them we would hear
voices on the above
dates.

1252

In all we have to
date received and recorded
64 applicants and
there are several to
come. We gained for
ourselves three very
busy days and are no
doubt richer in
experience. We
now have 64 records
from which to choose
voices to do test
work of doubtful
value.

Nov 23

Noticed standing in back of reproducing horn, tone sounded much clearer and diction was very much better

Placing Mr Edison's stand for listening in front of reproducing horn with the horn going into the reproducing horn, brightened and cleared the tone, and helped the diction

Reproduced through old devil crab horn and found it sharpened and cleaned the tone, but was not as rich in quality

Nov 24

Kennedy, Miss Longwood
and I weeded out the
64 trails of voices
which we had taken,
reducing the total
number for him to
listen to to 12.

Compared blue violin record
to wax of same thing, made
in same way, at same time
and under same conditions.

Found the blue brighter
sharper and cleaner. Volume
about the same. Improves
the quality, I should
say.

Nov 25

Mr Edison listened to the 12 trials which we had picked out as the best.

He gave them fairly good ratings and then asked to hear some of the others. I played some, telling him they were second best. He thought them pretty "rotten."

"Well, I guess you have them all right", He said after hearing a dozen or so. I asked him if he didn't want to listen to some bad ones. "Don't these bad ones?" "No, they are second best" "Well they are bad enough."

We got a sextet accepted

Nov 25

Mr Edison approved wrapping
the horn entirely.

Gave him tests with horn
unwrapped neck partially
wrapped, neck entirely wrapped
Neck and bell both wrapped.

"I can hear it getting better
right along as you come up.
The horn wrapped is clearer
and firmer. Not much
change in volume."

Dec 1/16

We have written sketch to
report Monday, consisting of

Miss Rohmann,	Doc
"	Ford
"	Can
Mr Lamm,	Ten
"	Berry
"	Whiskint
"	Bar
"	Myers
"	Bar

Per the? Ok we'll wait.

Recorder 107 which is armless
tempered aluminum remains
unbeatable. It is made like
129 + 130 of last winter. It
appears we can also use re-
corders of smaller diameter
on this horn.

$\frac{3}{4}$ inch recorder of 107 type
should be a winner

Dec 4

Seattlet began operations today.

They are six congenial persons. Voices blend well and they are musical.

They are on much higher plane than anything heretofore. Too bad there isn't a more definite purpose connected with their work

Dec 11

In order to get tests exactly in the same manner, decided to use disc machine on cello stand in recording booth directly under G, replacing vocal and instrumental tests.

Mr. Brown decided Miss Sholnik was not needed here except in the orchestra and that she was not to continue except on these days.

The orchestra is re-moved for Holmesday:

Concert Master	Miss Sholnik
II Violin	Mr. Sholnik
Viola	Miss Sholnik
Cello	Mr. Sholnik
Bass	Mr. Sholnik
Baritone	Mr. Sholnik

Miss Sholnik

410

Mr Tushnett writes today
he is in Boston and will
be there with Musical show
until Christmas. He sug-
gests Mr. Brown's Lib. vol.
617 & 198 as substitu-
tute until that time. He
wrote Linnell to come.

There are at last signs
of bringing these recording
experiments to a head, and
it can't be too soon.

I am going to stay to the
finish but can't see why
that shouldn't be by Christ-
mas. The new horn
is in many characteristics
different

from the present time
regarding and whether he
likes it or not, Mr Edison
ought to tell by the station
and then there are three
courses open:

- a) Build another line
- b) Start making Con Edison
- c) Cut it all out

Dec 22

Orchestra and sextet worked several weeks. Bill Hayes recording got them up to commercial volume and records stood out. We were working principally for loudness and worked as near horn as possible.

The sextet was fine and we congratulated ourselves,

but Mr. Edison's verdict was "Better, your recording has deteriorated 200%".

Said we were working too near the horn and his evident desire is to

make records from the middle of the booth and get have them loud. It is an almost impossible task but that seems to be our problem. The quality is unquestionably better from a distance and ensembles blend better but the volume at 8 feet is very weak still.

We have suspended the sextet and orchestra to try and get more sen-

sitive records.

Bill Hays has been recalled from here. The "Old Man" said Ed sent him over there just to do what "according to your wants". Kindly, he has done a little more than that. "I'll bring him back then."

Jan 2, 1917.

At New Year's we can certainly duplicate what we did last winter and show some improvement. We cannot however retain same quality, and make records stand out as the disc records do, nor can we record from the center and back of the booth and have records sufficiently loud as Mr Edison seems to want us to do.

It looks like an impossible task upon which he has set us. Impossible

at any rate to conventional
recording methods. If the
deed is to be "did" it will
be by something very
radical in my opinion

Jan 12

I have often wondered what becomes of sound waves after they hit diaphragm of recorder. It has always seemed to me there was no outlet other than back through the horn, and the struggle for freedom of the returning waves against the incoming waves must have been frightful in the wave world.

It has always seemed to me an expanding chamber in the recorder would ~~cancel~~ eliminate some of this fight by giving it more room to spread out in.

Kennedy is now trying such an experiment. The results so far seem to show a spreading tone rather than a concentrated resonant one.

I had imagined the result

would have been just the
opposite.

It now appears that waves
after striking diaphragm
do not come back through
the horn but go right
on through the diaphragm
and arm and what waves
are not killed by friction
etc go on into space.

Jan 17

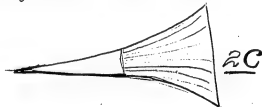
Following is outline of the horns we have tried and the way they have been designated in notes.



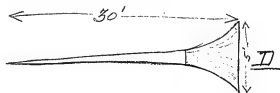
Neck of original #2 horn with large flare added.



Which is twice the size of RA and of same shape materials etc



Which is twice the size of RB and of same shape materials etc



Which has the bell of RB
with a long gently tapered neck
replacing neck of RB

Dimensions - Length of neck 20 feet
Diameter where neck and bell join

14 inches

Diameter of bell - 5 feet

Length of bell - 4 feet

The small end of neck has 4
feet taken from cast brass horn
thus making a firm extremity to
the thin brass of the neck

Jan 19/11

Kennedy has succeeded in getting aluminium rolled to less than $\frac{1}{2}$ thousandth of an inch which seems to be promising, so promising in fact that he has a "systematic" scheme for building diaphragms out of it that at the pace we are going will take several months.

After this there are electroplated diaphragms of a million or so varieties to be tried. By which ~~the~~ numerous other opportunities for experiment on diaphragms will no doubt have presented themselves.

By the time we are ready to do something, it will be had time in eternity.

My suggestion in the fall of adding more mechanics would have had this field covered before this

Jan 23/17

Last week I wrote Mr. Carson telling him my candid opinion of what we have done so far and what I thought we ought to do now.

In brief I thought present horn admirable for big orchestra and large choruses but that a smaller horn would produce better results for solos.

I suggested we get 15 violinists out for a day or two and let them play in unison also that we get a church choir out for a day, in order that we could get some idea of what we can do with a big crowd.

Suggested we ought to try the disc also.

He has paid no attention to the note so, while he may have given it some thought, evidently my opinion is not wanted so hereafter I feel I should do what I am told - no more, no less.

Feb 11/17

Met Mr Edison and he told me "I am in a hell of a mess" and am afraid I'll have to close up over there until I get free and can come over myself. I am going to Florida next week and I don't know now when I'll get there but I'll make things move when I do."

Later we played some records for him and while he didn't like the recording, he said nothing about closing, but I am sure he hasn't forgotten it.

Our recording is much brighter and has a great deal more life and pep than the disc and eliminates the extra fullness the disc has

I am convinced the quality
we were aiming for and
approaching in our recent
recorders would make the
Edison phonograph as adapted
a genuine competitor of the
Victor, with the addition
of course of a large catalogue
of records.

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-20-00-00.3**

This undated notebook was used by Edison and Absalom M. Kennedy, probably in 1916, for notes on experimental recordings and tests made with various numbered recorders. The entries are by Kennedy with additions and comments by Edison. The front cover is labeled "Mr. Edison Notes - Columbia St. Studio." The pages are unnumbered. Approximately 15 pages have been used.

Tract of Records

9 { #132 Model 100
#100 102
#129 95 blubs -
#103 110 -

6 { #130
#100
#118

7 { #108
#132
#129
#103
#123

#108 102.

#130 100

#127 105 blubs

#123 100 blubs

#104 98

#118 115 blubs + scratches

#113 120 - best so far - Quality good

132 105 Standard -

131 108

102 102

134 108

109 108

121 102

{	#132	105
	134	102
	120	102
	107	115

{	117	102
	115	105
	107	102

{	132	105
	126	115@18
	128	110
	106	105

" Standard #63. 100 11mm

{ #132 - 175 @ 190 -

7 { #128 160 -

#126 - 175 ~~at 150~~ @ 190

{ #113 "

18 { #121 "

#106

{ 105

19 { 130

129

Barnes &
Rachtauchen
good passed

Volga Song - Mirlitons
fair -

Diving Song - Barnes
No

Sanctiago
get this - good -

Norwegian Slumber Song
No

all Gayann
Dances -

MO

Estudiantina

good - w/ get x

Invitation to the Dance x

Not to good but 1st part arrange
instruments different

Rispetto & dainty Butterflies

good -

La zingana

good.

Sari Walz

No -

Blue Danube Walzes

good - get it

Italian Suite I

No

Italian Suite III & IV

No

Kennedys Song

first part beautiful

Wedding Dance

Not -

Anthony & Cleopatra
fair to good. Violins & cellos
stronger than fundamental in
most of the tunes - in this
its very bad -

Anthony & Cleopatra II

not played right -

Chinese Wedding March

good - think got it

Carmen I
quod - quod d,

Ballet Egyptienne

quod . just d. Hémis

Test of Records
 Piano at 12 ft
 Back covered with felt. 6"x10" opening

#100	100%
102	100
103	103
x 104	90
x 105	92
106	100

107	100
108	102
✓ 109	105
✓ 110	103
✓ 113	105
114	103
115	102

117	101
✓ 118	105
x 120	95
121	100
123	101
126	105
127	105

128 — 104
 x 129 — 85
 130 — 102
 131 — 102
 132 — 103
 50 — 103

Test of Reordero with Jislin

#100 — 100
 102 — 103
 103 — 100
 x 104 — 100
 x 105 — 100
 106 — 100
 107 — 100
 108 — 101

109 — 100
 110 — 101
 113 — 101
 114 — 101
 115 — 101
 117 — 103
 118 — 104

x 120 ————— 100
 121 ————— 102
 123 ————— 101
 126 ————— 101
 127 ————— 100
 ✓ 128 ————— 102 @ 3.
 x 129 ————— 101

130 ————— 100
 131 ————— 102
 ✓ 132 ————— 103
 50 ————— 102

Harmonium Test
 Recorder #113
 Distance 7'

① Without Reflector 102
 ② With Reflector 106

Juvlin Test
 Recorder 133
 Distance 10"

① Without Reflector 100
 ② With Reflector 100

Comparison Large Small Horn

R 118

Distance = 12"

- ① Violin with Large Horn - 100
② " " #7 Horn 100

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-17-01-06**

This notebook was used by Absalom M. Kennedy during January-February 1917. The entries consist primarily of daily logs of experimental recording activities at the Columbia Street Studio using various kinds of music and recorders. Included are comments on the loudness and quality of the sound. The determination of quality was based partly on "tone tests" in which a performer's recordings were compared to a live performance by the same individual. The notes indicate that Edison oversaw the work and periodically listened to the experimental recordings and that E. Rowland Dawson and Clarence B. Hayes assisted in some of the experiments. At the beginning of the book are two pages by an unidentified author noting the numbers of blanks on hand. Inserted into the book is a three-page handwritten list by Kennedy with entries numbered 1-27, along with a related typewritten list. The front cover is labeled "Notes, Columbia St. Studio from Jan. 6, 1917." The pages are unnumbered. Approximately 40 pages have been used.

Blank

Nov. 24th

In Land 19 B.T. White, Land

Apr 24th

In 11:00 263 Trial Blank
including experiments held for
Mr. Ed. Sh.

1/6/17.

Trials of #0 head expanding
against #3 " contracting
taper.

Showed conclusively that the
expanding head was louder,
fuller & richer sound.

With disc machine at 6' did not
make as much difference as at
4'

Dawson showed me Bettevici's
Funeral March made here and
in #4 Reg. Farmer is better
in quality & naturalness than
former and in the musical
arrangement - as the latter
sounded staccato beside it
not in keeping with a funeral
march at all.

Made record of all records
for Mr. E.

Must get machine ready for him
when records on.

1/8/17
 Dublin

① 100

② 104 Sharper

③ RB-Head X

④ RB-Head Y sharper

100 100

105 110

100 100

110 110

The above tests are to show the
 inference of expanding paper head.

In both cages they show

① Superior tenderness

② Less tendency to blast

③ Greater firmness

④ Greater sharpness

⑤ Greater "stand out of horn".

voice

① Ring B-Head Y

Ring B-Head X

Ring D-Head X

Ring D-Head Y

110 90

100 100

100 100

100 105

The above test does not
 hold out on voice as
 with Dublin,

RA - Head X
RA - Head Y

100	100
90	90

This entirely reverses tests made the first time that the expanding head made the records louder & sharper. In this case the contracting head showed louder & fuller than the expanding

Quartile at 5'

① Ring B Head X
② Ring B Head Y
① Ring D Head X
② Ring D Head Y

100	100
110	90
100	100
105	110

Above results contrary.
must work over to prove up.

1/9/16

100

3

7

B

* A

100 100

120 100

90 110

90 120

85 100

Ring 3 shows up louder than 100 but similar in quality - sharp.

Ring 7 is not as loud, but good full quality.

Ring B shows less surface than any not quite as loud as 100 but excellent quality.

Ring A - not as loud as any & not extra good quality, need to turn up.

Ring A Head X

Ring A " Y

Ring C " X

Ring C " Y

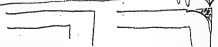
100 100

100 95

100 100

90 95

Poured wax in head & to round off back edge



Violin
Ring A Head X

100/100

Ring A Head Y

110/110

Voice
Ring A Head X

100/100

Ring A Head Y

115/100

It is evident that filling in with
vocal improves these expanding
taper records.

Voice
Ring D Head X

100/100

Ring D Head Y

125/125

Shows up superiority of this head
even though Dawson does not
sing as well in second case
as in first.

Violin
Albano ~~that~~ made showed head &
louder & on tone but trifle more
natural.

Phonograph
Ring D Head X
Ring D Head Y
Dawson stands out better.

100/100

115/110

Voise Dawson

Ring 3 Head 0

Ring 3 Head 2

100 | 100

120 | 120

1/18/17

100	sharp - loud - stands out	100	100
E	Does not stand out as well - fuller	100	120
* A	Full of noises - rattles	90	—

Ring E - Head X	punched,	100	100
Ring E - Head Y	light ^{bow} cattle	100	110

Tried tone test on above. Head Y shows very much more natural.

Contrasting Recorder # 130 with

No B

130	Sharp - stands out more	100	100
B	sweeter		

Violin & Piano

130	sharp -	100	100
Ring B - Head X		85	110
Ring B - Head Y		100	125

Volume by Listening
Quality by tone test

Price - Dawson

Ring E-Head X

100/100

Ring E-Head Y

120/125

Volume compared by listening
Quality by tone test.

1/11/17.

Tried out new heads A & C. A was reluctant same as A of yesterday except that a heavy coating of phellac was put over the disc and around edges so as to firmly bind this disc to the diaphragm.

E was disassembled by taking off arm & foot, shellacking disc as above and rephasing arm & foot.

This seemed to improve both records as following test shows both quite high while they did not on previous day.

Comparative trials showed as follows.

#100
 a-x
 a-y
 E-x
 E-y

100	100
90	110
110	120
90	110
100	120

Then made tests of all reapers
 with violin to determine one best
 for comparative clearing
 Volume test regular
 Quality test by "tone test"

#100

{ A sharper & stands out more
 { B even
 { C little further back than C
 { D full
 { E sharper
 { F
 { G
 { H
 { I
 { J
 { K
 { L
 { M
 { N
 { O
 { P
 { Q
 { R
 { S
 { T
 { U
 { V
 { W
 { X
 { Y
 { Z

100	100
115	120
110	115
115	110
110	120
120	115
115	110
110	110
115	120
120	120
110	115
115	110
105	115
105	120

11/12/17.

B-X
B-Y
B-Z

100	100
115	115
125	120

The Y head is much sharper than X or Z. Z is much louder & is the most natural.

In making these records the room was so cold it was necessary to heat the machine. This was overdone and the temperature of the wax was about 105°.

Compared B-Y made yesterday with wax about 65° and to day about 105°. Found that today records were louder & fuller.

Made test with paper diaphragm between nozzle and horn.

Records both on violin and on voice show that the paper not only thins & shortens tone but

promotes blast on a resonant
note B³ in this case.
Voice - Dawson -

DX		100	100
DY	louder - sharper - more open	115	125
DZ	clear pure - true tone further	165	180

Tone feeling shows
X fuller than Dawson
if brighter or sharper than Dawson
if most closely approximate quality.

With Phonograph

DX		100	100
DY		110	120
DZ		115	120

Used the above record on
Standard machine in music
room. Results less marked to
me than the above.

Hayes gave DX best in "Uncle
Sam's" DX best more & DZ in another

Will try other reproducers on

①- 100-100 ②- 120-110 ③- 150-¹⁰⁰80

machine in studio and attempt
to determine where trouble lies.

1/15/17.

Test of new ~~head~~ Ring
#1 against #100

#100

Ring 1 - Head Z

100	100
60	110

Same to see whether head or
recorder makes difference

#100

Ring 1 - Head H

Ring 1 - Head Z

100	100
55	110
60	120

Ring 3 - Head H

Ring 3 - Head Z

100	100
110	100

Too cold for recording at
4:15 P.M. Temperature 58°

①	100	100 - 3
②	90	120 - X
③	90	90 - 4
④	110	100 - 100

			<u>Time test</u>
100 - 100 - 100	①	- 85	X
84 - 90 - 90 -	②	- 90	100
8X - 90 - 120	③	- 95	Z
83 - 85 - 110			

① - 100-100	chant.	Z
② - 110-110	full rich -	100
③ - 115-115	not as full chords cat better	④
④ - 115-115	about same.	4

3-4 - full muddy goes to pieces.	100-100
3-0 - louder chords & richer	110-115
3-Z - further back - less clear	90-110
100 - higher back does not become	100-105

11/10/17

Tried the following records and had them run in unknown order and rated as follows:

①	83	} Violin	100	100
	82		90	120
	84		90	90
	100		110	100

Again Rating only on Quality
 This time test = 100 being perfect
 violin quality.

82	85
100	90
83	95

- 4
 with Dace (Dawson) not
 knowing which is which.

3-4	100	100
3-0	110	115
3-Z	90	110
100	100	105

①	100-100	BZ	92
②	90-110	O BX	88
③	95-110	O BX	90
④	85-105	O BX	96

Bassoon

Test not knowing Violin -			Time 9.2
BZ	100-100		92
BX	90-110		88
BX	95-110		90
BZ	85-105		96

Comparing Presoled make on
Cory Kern RDN-g with large
horn R113.

Tested with violin, B-Z against
2-Z (Hayes just back). Found B-Z
not only better quality but
louder, particularly on the
higher notes.

This would seem to show that
we have improved the rearing
and are ready for heavier trials.

- ① -100 - full
 * ② - 90 - struts cut better using
 ③ -120 - sharper -

Out out A

1/17/17

Take up personal equation
in playing

Tone Test

① - BZ	100	100
* ② - AZ surface	95	100
③ - 1Z	100	105

These bumps were made (A & 1) with .0005 aluminum in place of .001" as B which is best on violin.

Seems that the thinner does not make materially louder.

Voice

Tone Test Val

3Z	80	100	100
* AZ Rakes Pouch Too much surface	110	120	
1Z " " Full fine	95	115	125

This proves somewhat above
 on voice the thin aluminum is
 much nearer the true quality
 of voice.

Test on Miss Rushbinder

2Z

1Z Fuller.

100	100
120	?

? Baked up better on tone test
this recorder is much fuller than
#3.

Further tests both on violin & voice
showed ping 1 to be loud & full.

①
②

100
120

no time

①
②

100
125

11/18/17
First New Recorder - Violin

BZ
SZ

Total	
100	90
83	96

Same Voice

3Z
SZ

Total	
100	96
80	92

~~Mr. R. B. Co. Mrs. R. B. Co.~~
~~Co. R. B. Co. R. B. Co.~~

Made record of Kuia-wiak on violin with SZ. Have never been able to get this without blast before. Made record without even moving back of this showing no blasts. This record is somewhat sharp but holds better than any we have. This was even in spite of turning the piano closer.

Mr. Lowrey brought Miss R. B. out. Made record of him with pump 3-5-D. Did the best

on Lawrence's voice - 3 is a trifle
sharp - but makes it stand out.
2 is richer, fuller & holds better.

Miss Beatty has a "spotted" -
mezzo soprano voice which
changes quality & becomes fuller
especially on her high spicardine
tones. For this reason 5 which
is sharp & holds was best for
her but did not even reach
perfectly.

Am encouraged with results
to day.

It is also evident that head
I makes records sharper &
louder & stand out more than
X or the old 3 we used before.

It is therefore possible to note
only lighter & make sharper
by different pumps but also
by different heads.

① -

①	champs	100	100
②	banjo + sharp + clean	105	110
①		100	100
②		95	95

2pm.

11/9/17

Dawson points out that recorder #5 of yesterday has probably loosened up & changed.

At first it was very weak and sharp. Then an violin record of Krumpholtz - Lander & Reed. On Miss Beatty, blotted somewhat.

Will try it out to day and see what it does.

		Dec	Jan
	<u>Violin</u>		
100		100	90
5x	sharp	90	90
5Z		90	85
	<u>Violin</u>		
5Z		100	100
5x	<u>voice - 4th</u>	105	110
5Z		100	
3Z		120	
5x		120	
3x		125	

Test showed that #5 recorder had not become noticeably looser than since first made.

Is firm and feels fine.

- Keep all sorts of banking.
The resultant records ~~are~~ when
made close are hard - and
stand out as no previous
records ever have.

0

1/22/17
Osslin

100	100	100
8x	90	110
8x - fuller -	85	115
AX -	80	105
EX - sharper harder standard	85	105
FX - hard full - Some surface	110	115
IX - loud full - surface blast	110	110

Tone both same
fuller than vocal

IX	85
EX	95
EX	90
AX	95
8x	85
5x	90
100	90

woody
Voice Dawson - U'

100	100	100
IX	125	115
EX	125	115
5x	85	110
8x	90	120
AX	85	115
EX	90	120
EX	120	115

153

Dawson Voice - close up.

5 x	sharp.	100	100
8 x	fine surface fuller - best further back	95	110
✓ E x	good - starts out natural	105	115

Further tests on voice and on violin playing. Kinnick showed the superiority of recorder E. This is almost if not quite as loud (close up) as #5 of last week and has much better quality - is clean clear & fairly full. Makes best records both of voice and of violin.

Tomorrow will test the pressed series (#1 and F) from distance for ~~similarity~~ and use Regd Z in place of X with them.

①
②
③

A
E
100

Same Test

100 100
95 110
105 110

85
95
85

1/28/17

Tested new recorder A as follows
Violin

100 100 - 100
EX 92 - 110
AX 95 - 100

Violin on Saxophone

100 100 - 100
AX 110 - 90
EX 95 - 120

Comparison AX & AZ

AX - better, fuller 100 - 100
AZ - sharper, cleaner & better 110 - 110

Same on O side, etc. &'

AZ - 100 - 100
AX - better, - cleaner - 105 - 110

Then tightened head A.

On violin, horns better, becomes

sharper & cleaner & better.

On voice, very much better, cleaner
& better definition.

Violin & Voice

* AX tightened
EX

100-100
110-120

AX does not equal EX
either on violin or voice.

Made tests of recorded E on
Mrs. Buschlinger. Found that it
is natural & good.

Made comparative tests of
rings E & of both on voice &
violin. On voice I showed
blubs and was not so clear.
On violin got curious effect.
E brings out the violin's
makes it clear, clean, prominent
and natural and ~~like~~ the
piano back. I makes the
violin no longer but brings
up the piano making it much
louder than before.

I believe that E quite
show the effect of distance
much more than F or similar
free records.

1/24/07.

Tested out poor. done as follows:

100	100
EX	95
AX	90
S	70

Yone Test Dielein

100	85
EX	75
AX	70
S	70

Deice - Dawson.

100	100
EX	90
AX	85
S	95

Gene Test:

100	85
* EX	92
AX	90
* S	97

Sold in at Teston machine in
music room offered 2 better than
S. 3 too good & back.

Comparison Eq₄ & 5 - within
Kluamuk - E is louder, sharper
stands out better, S is more
ligger, duller & longer note.

Companion to S on a piece
of Mats. Bunkaid - allusion
to a friend. The name of the
girl who with her mother was
fallen, and so.

I should like to hope that the sensitive people in the world show better distance.

at 8'
E-100-F-120 S-110

Σ-100 at H' 9-12.0 5-11.3

at 1'

E-100. F (holes) 13.5 S-110.

1/25/17

Tests of 5 recorders with small
tube against large tube.

Voice

With the large tube the sound is
louder, clearer, & carries out
better. Little improvement.

Violins

Same position - the sound is
louder, clearer, & carries out
much better than the large
tube.

Tests of 5 recorders

with small tube

Voice

With the large tube in cleaves
and in other positions. It is
better.

Violins

It shows up much louder on
this cleaves & very natural
in tone quality.

Voice

It shows up louder, clearer
& better here also.

Order

Ring EX

EX	100	100
EX	90	105
EX	95	95

10000

EX

EX	100	100
----	-----	-----

AX

AX	90	105
----	----	-----

8X

8X	95	100
----	----	-----

Order of exchange

AX	100	100
AX	90	90

AX

AX	100	100
----	-----	-----

AX

AX	102	105
----	-----	-----

Order of exchange

Order of exchange

①
②S
E

Violin

100	100
90	90

Voice

100	100
95	110

①
②S
E

1/26/17.

Had records I made up so that the hole, seemed fit for nozzle and transmission which we have.

On test with violin and with
Dauvone voice
Violins

S

100 100

EX

90 90

Voice

S

100 100

EX

95 110

A number of records made previously and today were taken over to the music room to compare on machine there.

They showed as follows

S, small hole

100 100

S, large hole

120 100

S, 1/2 hole

110 105

Comparing D. & E on voice & violin showed S apparently the better on violin, but E the better & louder on voice.

(21)

1/31/17.

Damon made up two new recorders. Both whistled on test.

Tested #1 Recorder, made of softened .0005" aluminum, as follows:

100		100	100
1X	(bleeds)	80	105
1X tightened	surface-sing	87	110

Proposed recorder however is way back in the horn & weak & dead. The quality is good but volume is weak and sounds too far back.

On tightening up, became firmer and a little louder, but developed a slight whistle or squeal which shows as perfect.

There is one curious feature to these ring recorders that I do not understand. #100 & #100 a head recorder is louder than any of them. Is it possible

that, as some of the first
results seemed to show - that
the head recorders are louder
than the ring recorders - it is
it that the straight head,
even on a trunnion not
designed for it, producing
an ellipsoidal chamber, is
louder than the more carefully
carried out ring recorders.

Check this by testing out
the regular recorders with
① Straight trunnion and nozzle.
② Tapered trunnion and nozzle.
③ Against similar ring recorders.

Test of Record #100 with
tapered trunnion against straight
trunnion

100 tapered trunnion
100 straight trunnion

100	100
110	80

In this the tapered trunnion was
not quite as loud as the straight
trunnion but was fair & true.

and heads. The ~~straight~~
 trunion was louder but blasted
 on powerful notes - was not
 so good in quality and went
 to pieces.

Companion dead 4 on
 straight trunion, tapered
 trunion & same recorders
 on head X.

1	R3	head 4 - St trunion	100	100
3	"	4 - Tapered trunion	90	110
7	R3	" X - "	95	115
3	R3	" 4 - St trunion	100	100
1	R3	" 4 - Tapered trunion	105	110
7	R3	" X - "	100	105
3	RE	" 4 - Straight Trunion	100	100
1	RE	" 4 - Tapered Trunion	102	115
7	RE	" X - "	100	100

Recorders 3 & 4 have changed
 On former tests 3 was sharp
 & fairly loud, now it is full
 & louder than 4 and in every way

better.

It is evident that the tempered
aluminum is not right - is good
quality but not enough spring
and come back to make the pond
live & lively.

2/1/7.

Comparison and scores

100

① AX

Surface

8X

Reels Too sensitive

100 | 100

10 | 100

110 | 70

②

AX

Too sensitive, Fine surface

100

Reels -

100 | 100

100 | 100

① A. showed too much surface - found
needle to have been broken off.

② Replaced needle & found too sensitive

100

3X

107

2X

100 | 100

90 | 120

85 | 110

75 | 125

[ITEM(S) FOUND IN BOOK]

- ① Sopranos, tenors and baritone scales showing correct and incorrect scales & notes.
- ② Compare correct & incorrect opera recitations.
- ③ A cylinder record showing very faulty interpretation.
- ④ Compare Anna Case's faulty sustained notes also pure sustained note & tremolo on sustained notes.
- ⑤ Records showing sudden change in timbre. Indicate by light or heavy music mark.
- ⑥ Compare sharp & full & mellow voice on same piece. "Have blackboard showing drop in overtones.
- ⑦ Chart showing scales of some of our singers, photo micrographs of these showing overtones.
- ⑧ Records of true notes with tremolo or one or two tremolo notes.
- ⑨ Chorus singing in pitch & out. Use ours with & without tremolo.
- ⑩ Show by chart what a beat comes from - 1, 2, 3 & more
- ⑪ (2)

[ITEM(S) FOUND IN BOOK]

- (12) Have Nernst duplicate a well known song backwards.
- (14) Rig up chronograph to record personal equation
- (15) Model of larynx - vocal chords show they work - also mechanical illustration show schemboly irregular larynx
- (16) Rig up diaphragm with mirror to which mirror to show volume of sound.
- (17) Show model diaphragm, diamond right hand on edge of which is waves.
- (18) ?
- (19) Show mechanical timbre in vector
Tree acoustics in pure.
- (20) Show very poor & very good scale
- (21) Illustrate uneven singers - one who on some notes blasts - another who is even throughout.
- (22) Record with perfect contralto, mezzo soprano, soprano, contralto, basso, bass-baritone, baritone, high baritone, tenor pieces to sing & practice by.
- (23) Record in German, same man in Italian, same in all vowels.

[ITEM(S) FOUND IN BOOK]

3

- (24) Illustrate Puck & Judy characters to ~~sopranos~~ by over speed & contracts by underspeed.
- (25) Have two phonographs one regulating correctly other not - to illustrate.
- (26) Have cylinder recording machine to take scales from audience. Preserve good ones & send to Orange. Have Piano.
- (27) Chart illustrating waves of trombone, cornet, clarinet & sax instruments. Show fundamental without overtones other both superposed.

[ITEM(S) FOUND IN BOOK]

Get after Hayes.

[ITEM(S) FOUND IN BOOK]

Kennedy

- * 1 - Several Soprano Solos from Foreign Post, also Tenor & Baritone - if Werner can ~~displace~~
- * 2 - Rejected Opera pieces for illustration, also cura & Regular.
- * 3 - The Cylinder record for Zero. ~~Interpretation~~
- * 4 - Anna Ode sustained, also Newark woman in Ave' Maria on sustained & compare with bad sustained, tremolo.
- * 5 - Records showing sudden change of timbre. Have the music & mark the part so audience knows when it comes.
- * 6 - Records showing a sharp Voice & same tune, if possible a mellow Voice. ~~Have black-board showing drop of overtones.~~
- * 7 - Chart showing scale, notes as record looks under Microscope with overtones, many of our singers.
- * 8 - Records showing no tremolo on most all notes & then one or two notes with tremolo.
- * 9 - Chorus singing where they sing to pitch & where they do not. Use our & Victor's with & without tremolo.
- * 10 - Show by chart what a beat comes from - 1 beat 2, 3, & more.
- * 11 - Have one of our singers start every note full strength & cut off sharp - then another rising for interpretation.
- * 12 - Sing a well known song in even monotonous volume, then another proper inflection, then another dramatically.
- * 13 - Werner ~~has~~ a well known song backwards.
- * 14 - Rig up a chronograph to record personal equation.
- * 15 - Model of the Larynx - Vocal chords, & how they work - also a mechanical illustration, show Hermann's artificial larynx.
- * 16 - Rig up the diaphragm with mirror to show volume of sound.
- * 17 - Show Model diaphragm, Diamond & 6 ft. board on edge of which is waves.
- * 18 - Record sung in ~~trio~~ sung solo, sung Regular way.
- * 19 - With Victor, illustrate mechanical timbre & same tune with ours, show effect of suppressing mechanical false waves & adding overtones.
- * 20 - Show a very poor scale & a very good scale.
- * 21 - Illustrate an Opera song where volume of sound is ungiven, & some notes so powerful as to throw recording mechanism out of gear, while another Opera singer gives even volume.
- * 22 - Records with scales perfect, for Contralto, Mesosoprano - Soprano & Coloratura, Dittos Basses, Bassbaritone, Baritone & High Baritone, Tenor - To sing to & practice by.

[ITEM(S) FOUND IN BOOK]

- 23 - Record in German, same man in Italian, same in all vowels.
- 24 - Illustrate Punch & Judy Character given by speed & Contralto like by less than speed.
- 25 - Give song with two phrases. reproducing simultaneously one only adjusted. X
- 26 - Have Cylinder recording machine & take notes from audience. Save those which are good & send with name to Orange - Have Piano at lecture.
- 27 - Illustrate Chart of waves of Trombone, Cornet, Clarionette & all the instruments. Show fundamental waves without overtones, & then side by side, the same waves with the overtones.

21. 10. 1954

4

- P. 125 - "Denn es ist ein offenes Geheimnis"
 - S. 126 - "K. hat sich nicht mit ihm getroffen"
 - S. 127 - "Denn es ist ein offenes Geheimnis"
- Reduzierung auf die Linie (nicht "Abbildung")

(28) Delusion Experiment: Violent people
low and flat. Strophene continues
same with acid.

[ITEM(S) FOUND IN BOOK]

1912-12-
 1912-12-
 1912-12-

[illegible]

**Notebook Series -- Notebooks by Edison and Other Experimenters
Recorder and Recording Experiments -- Miscellaneous Books
Notebook, N-19-01-10.2**

This notebook was used by Edison and Walter H. Miller in 1919-1920 for notes on experimental recordings. Some of the experiments took place at the Columbia Street studio in West Orange; others were performed at the Edison company's New York studio. The early entries include substantial comments by Edison. The later entries are all written by Miller, with occasional notations regarding Edison's opinions. Some of the experiments involved the use of a 40-foot horn. Inserted into the book are numerous loose pages of comments by Edison, some of which are summarized by Miller in the book. Most of Edison's notes indicate the page of the notebook to which he is referring. These notes appear on the microfilm immediately following the page to which they are keyed. In addition, there are six loose pages of notes by Miller, which refer to six experiments (#823-#828) at the beginning of the book. These notes appear on the microfilm immediately following the relevant notebook page. The book contains 144 numbered pages, some of which are blank. Several pages were removed from the front of the book prior to pagination.

Please return this
book to

Walter H. Miller
Edison Laboratory
Orange

N. J.

Long horn later $\frac{17}{32}$ to foot

New	End piece for Reg. was	$\frac{14}{16}$ to foot
"	" " for 7/8 Revolver	$\frac{12}{16}$ to foot

1) Harris used Exper #826

Experiment 826 Columbia & Studio

826-A If we call 1 ft 100 loud

Notes -

1 ft is about $\frac{1}{3}$ as loud as we need to get it showing a very sensitive recorder - it should be twice as loud

2 ft - 75

3 - 65

4 - 60

5 - 59

6 - 59

7 - 58

8 - 58

9 - 57

10 - 57

826-B

Notes - Has bad flubb or jump or flutter on one base note. It's $\frac{1}{2}$ the strength it should be for regular work

1 ft 100%

2 - 85

3 - 80

4 - 78

5 - 74

6 - 72

7 - 70

8 - 70

9 - 70

10 - 70



826-C

flute

1	100
2	95
3	60
4	50
5	45
6	45
7	43
8	40
9	38
10	32

has $\frac{1}{2}$ Val it should have -

My ear not good for high notes

826-D

Bello

1 ft	100
2	75
3	70
4	68
5	66
6	63
7	60
8	57
9	55
10	52

only $\frac{1}{2}$ loud enough

Horn was for
Van Zandt



1 2 3 4 5 6 7 8 9 10

Rea #68

Record tests of Violin, flute, Cello Harp
in X horn, each separately at Col Studio

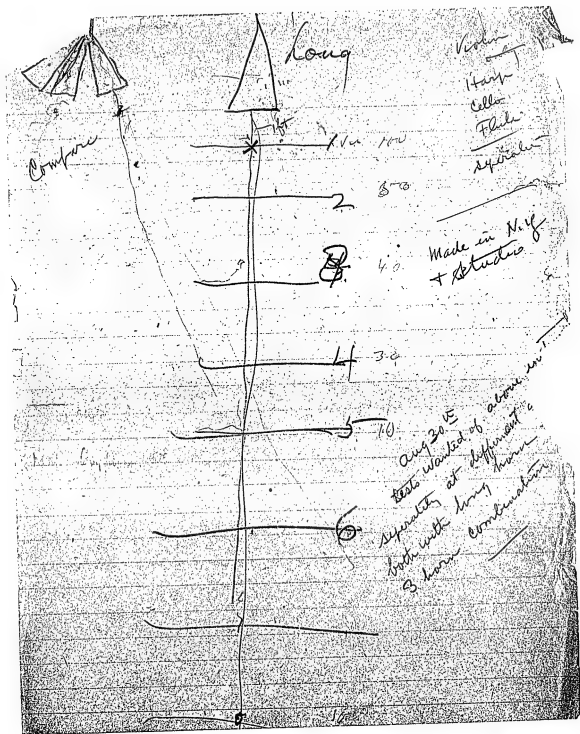
Ex ✓ 826 ✓

826-A
Violin

826B
Harp

✓
826C
flute

✓
826D
Cello



Make long horn in studio all instruments

" 3 horns in " all "

" 1 violin in " " "

N. 4.

Make Violin in long horn 12' bell

" " in short " 12' bell

" " " " " long horn

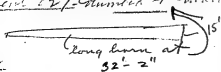
" " " long " " "

Make horn in long horn

28

3

Experiment 827-Glendon 4 Guides



827-A

Kirlin

1 ft.	Load enough	100
2	"	90
3	not load enough	80
4		70
5		65
6		62
7		60
8		57
9		55
10		52

827-B

Karp

1 ft.	Load enough for Ray
2	"
3	"
4	"
5	"
6	75
7	72
8	70
9	68
10	65

One note
Karp, flatter

4

for Orchestra 4 to 6 ft away
will be loud enough
& for solo as noted.

827-C

Blute

1 ft.	Load enough
2	not load enough
3	60
4	57
5	55

Rest about same 1/2 allo foot
after 1 ft - He don't play
with same Volume each time

827-D

Cello

1 ft.	for solo Load enough
2	"
3	70
4	65
5	62
6	60
7	59
8	58
9	58
10	55

Long Horn Col. Studio



1 2 3 4 5 6 7 8 9 10

Alto #68

Record tests of Violin, Flute, Cello, Harp
with above horns at Columbia studio
at different distances - each separately.

✓ 827

827-A

Violin

✓

827-B

Harp

✓

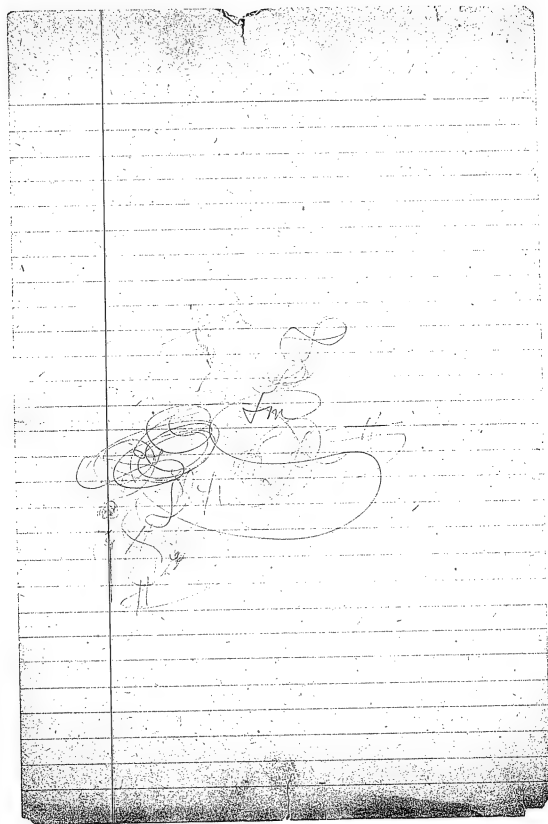
827-C

Flute

✓

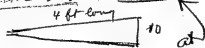
827-D

Cello



5

Experiment 848 - Glumina + Gled



848-A

Wolin

1 ft

2

3

4

5

loud enough
 90%
 75%
 60%

50% of original vol

848-B

Harp.

6

848-C
flute

848-D

cells

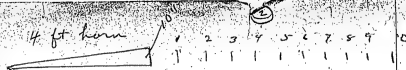
Walter - The 3 horns are
 Very Weak -

Long Horn loudest,

Short Single horn

not so loud as long horn

No room or hollow sounds
 quality same far away as it is close



Run # 66

Record tests of Violin, flute Cello + Harp with
above horn at col studies at different distances
- Will show comparisons of long + short horns

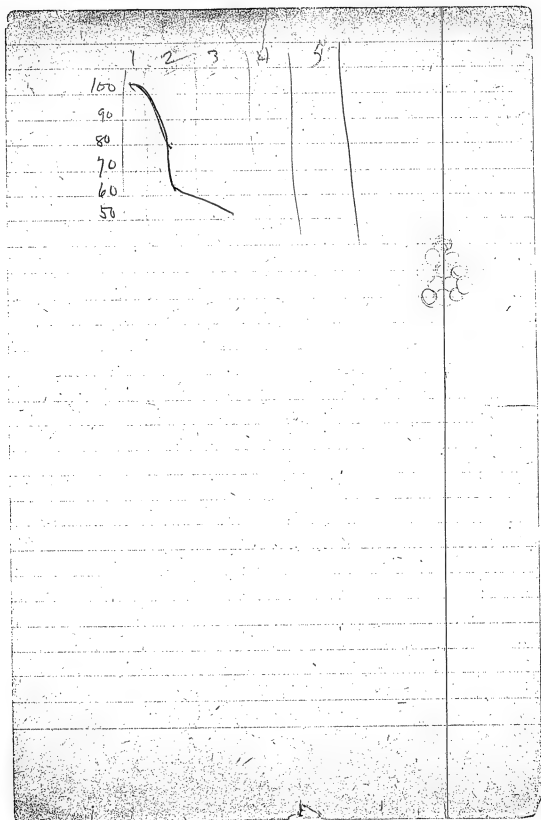
Ex 828

828-A
Violin

828-B
Harp

828-C
Flute

828-D
Cello



7

Experiment PR3 - N.Y. Studied Padded

PR3-a

flute

1 ft
2
3
4
5

loud enough for solo

"

75

60

50% of loudness

PR3-B

flute

1 ft
2
3
4
5

loud enough for solo

"

"

nearly

very little change in
val further on

But the blubber on
base notes very bad
note note like orange but
must all be done

8

PR3-c

flute

1 ft
2
3

not quite loud enough for solo
60%
50%

PR3-d

flute

1 ft
2
3
4

loud enough for solo
not quite loud enough
75
70

4 ft horn

1 2 3 4 5 6 7 8 9 10

Record tests of above horn vs. violin, Flute
Cello + Harp, separately at different distances at
N. Y. Studios ^{Record room} comparing both studios
with the same horn.

#823

823 A ✓
Violin

823-B ✓
Harp

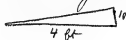
823-C ✓
Flute

823 D ✓
Cello

9

Experiment Prof. N.Y. Studio

Empty room

Prof. A
Berlin

at

Rotten
Barrel -
Room seconds
Bred

Prof. B
Harb-

Something wrong
interference
the not clear

Prof. C
Plate

Is this mean down in a
well — outside of this
around. There is 2 squares
at other 6 and things

Prof. G
Cells

This is better

- 1 ft — about right for 50%
2 — drops had 65%
3 — 50%

Don't rain right

4 ft horn

5

1 2 3 4 5 6 7 8 9 10

Oct 68

Record tests of Violin, flute, Cello Harp, with above horn
each instrument separately at different distances in
an empty room in N. Y. studio

824

824 A

Violin

824 B

Harp

824 C

Flute

824 D

Cello

Experiment No. 11. Y Studios



Same exper.
as 826, but
recorded in

835-A

Kurlin

1 ft is

Too weak for solo
then —

Dropis quick

835-B

Harp

1 ft —

Strong enough
but something wrong
with timbre above
bar —

~~Dropis~~

}

Quality of
none of instruments
very good —

835-C

flute

1 ft

2

not strong enough
60%

}

835-D

cello

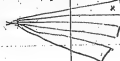
1 ft

2

not quite strong enough for solo
80%

}

Horn used for
Van Horn



1 2 3 4 5 6 7 8 9 10

Dir. #68

Record tests of Violin, flute, Cello, Harp in x horn
back separately at N. Y. Studios

Ex 825

825-A

Violin

825B

Harp

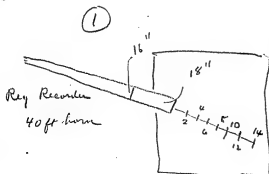
825C

flute

825-D

Cello

13



14

#1
2 ft about same loudness as Reg Phone
4 ft - loud enough 75% of
2 ft - better quality
6 ft 50% of volume as #2 ft -
8 - 40%
10 38%
12 37%

101 =

2 ft about same hardness as Reg phos

4 ft - Loosened Enough - 75% of

2 ft - better quality -

6 - 50% of Volume as # 2 ft

8 40%

10 38%

12 37%

} quality good
Base good

L

① ✓

K

Rig Recorder

40 ft. Horn

40 ft.

16" dia

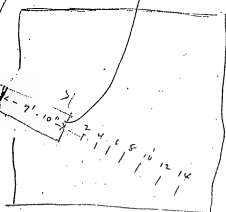
18" dia

2'-9" - 10"

5'

2 4 6 8 10 12 14

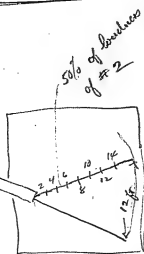
Page 13



15

(1 A)

Ray Recorder
40 ft horn



16

(1 A)

2 ft away 50% of 2 ft on No 1

4 - Weak

6 Very Weak

8 can just hear

1. A -

2 ft, only 50% of 2ft out to 1

4 weak -

6 Very weak

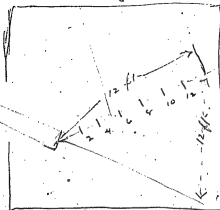
8 Canyon head -

(1. A) ✓

Reg Recorder
40 ft Horn
Wide angle

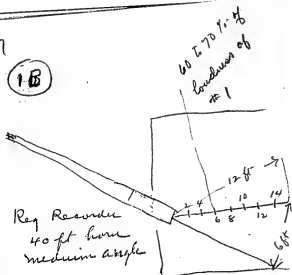
Page 15-

50% of 12 ft
of 12 ft



17

(1B)



18

(1B)

2 ft - about 65 to 70% of 1A

Rest in proportion louder
than 1A

Not near as loud as #1

1 B -

2 ft about 65 to 70% of

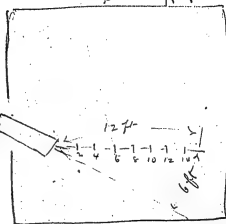
1 A. Rest in proportion

~~1~~ slender than 1 A not
near as loud as

501

1 B 5
Reg Recorder
40 ft. Horn
medium angle

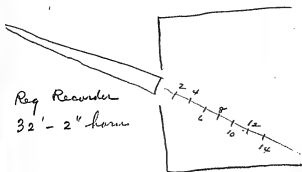
60 to 70% of
loudness of
No 1.



page 18

19

1 C.

Reg Recorder
32' - 2" horn

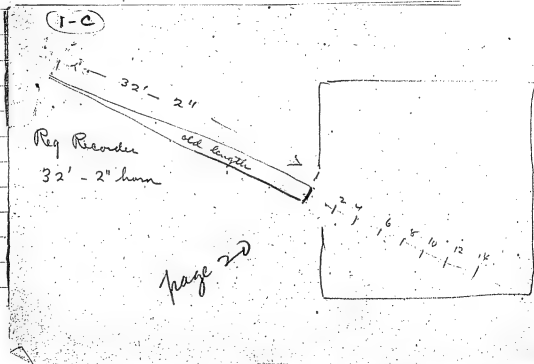
20

1. C.

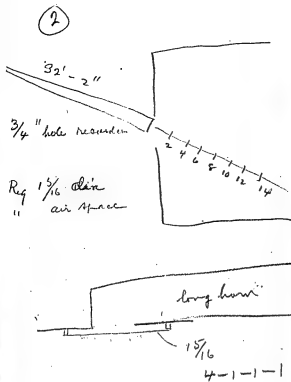
This is not as loud or good
as #1, but should save
85% of #1 - quality -
don't seem so good

1 C =

This is not as loud
or good as ~~#~~ #1 -
anywhere but should
say 85% of #1 - quality
don't seem so good



21



22

(2)

This is much louder than any so far

But diaphragm is not held up and controlled by air space enough and quality is like a cylinder phone with a very short funnel, sharp timbre, at 8 ft it is surprisingly loud

There is too much opening here to keep this opening to get loudness you must have either a smaller chamber, so air will control diaphragm better, or increase diameter of diaphragm to get more air cushioning

This is a good line of experiment as loudness is satisfactory only want quality

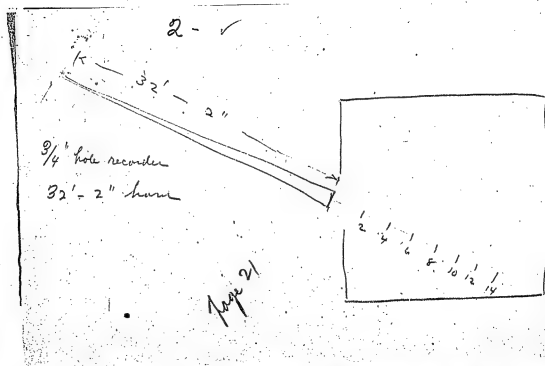
NO 2

This is much louder
than any so far, ~~but~~
But diaphragm is not held up &
controlled by air space enough
& quality is like a Cybex
shows with a very short
funnel - sharp timbre
at 8 ft. its superaurally loud

There is too much opening -
hence to keep this opening to
get loudness you must
have either a smaller chamber
so air will control diaphragm better
or increase diameter of Diaphragm
to get more air cushioning over

This is a good line of
experiments as loudness
is satisfactory, only wants
quicker -

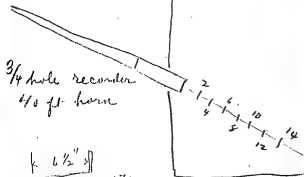
5



23

Same as #2 page 21,
Exptl Horn is longer


2A



6 1/2" - 1 1/4"

1 1/4"

6 1/2" - 8 1/2" →



24

(2A)

about same loudness as #2

quality a little better

think this is 80% of loudness
of No 2

This would indicate that
lengthening the horn did not
increase the loudness

N02A-

about same
~~loudness~~ loud as N02

quality a little better

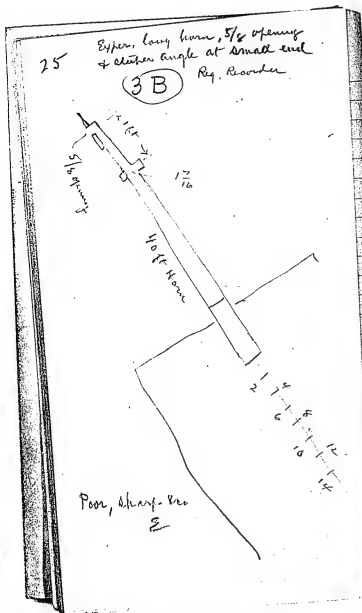
think this is 80% of
loudness of N02

2-A,

$\frac{3}{4}$ " hole Recardin

40 ft horn

page 23



26

3B.

Very Poor quality shark, bad
land at 4 & hear good
at 12

3-B Very poor quality
shampoo & hair

stand at 4 & hair good
at 12

page 210

4-B Quality milled

+ very much better

wants a little more

control by the chamber

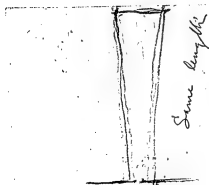
on chamber wants to cash

control more - night

change should be to 3/8

opening & chamber (opened)
a little -

9th June 1940
4-B
3-B
2-B



3 1/2 ✓

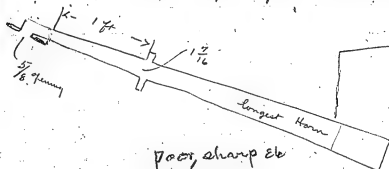
5/8 ✓

1/2 ✓

3/4

1/4

Experiment long horn with 5/8 opening
+ steeper angle at small end



poor, sharp etc

3-B.

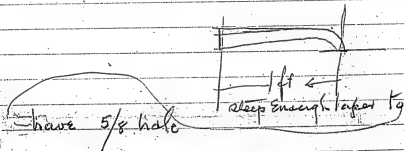
Page 26

2 4 8 12
6 10 14

DEC 3 1919

Walter

With your $3/4"$ opening there is too little cushioning of air not enough to make diaphragm hold - I think you should make the taper steeper for last foot so you



or another one with $1/2"$ hole -
Requiring $3/8$

As the waves are almost straight when they reach last foot you can make this foot a steeper taper without much loss & hence get a better cushioning

See

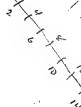
27

Exfer, long horn, $\frac{1}{2}$ " opening
+ steeper angle at small end
key recorder

4B.



11 ft horn



28

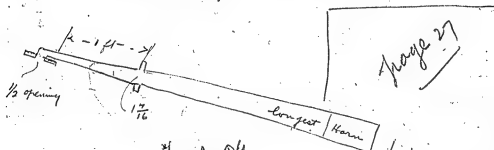
(4B)

Fairly OK but, another with
exfer is comes to $\frac{3}{8}$ opening
make another + run down to
 $\frac{3}{8}$

Quality mellow + very much
better, wants a little more control
by the chamber, air chamber
want to cushion + control more.
next change should be to $\frac{3}{4}$ "
opening + chamber lessen a
little.

2 to same loudness as 3B,

Experiment long horn with $\frac{1}{2}$ " opening
+ steeper angle at small end.



* fairly OK

cut another
with taper as close
to $\frac{3}{8}$ opening necessary

4-B.

Make another
taper + run down to
opening

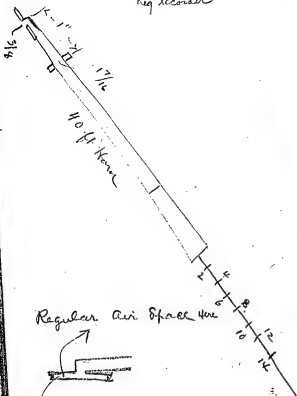
$\frac{3}{8}$

✓ 29 Upper, long horn, $\frac{7}{8}$ " opening
+ sleeper later at small end

5B

Diaphragm 1 $\frac{5}{16}$

Reg recorder



about $\frac{4}{1000}$

5B

30

Shade louder at 6 ft
Not much difference in quality
(compared with Reg Recorder)

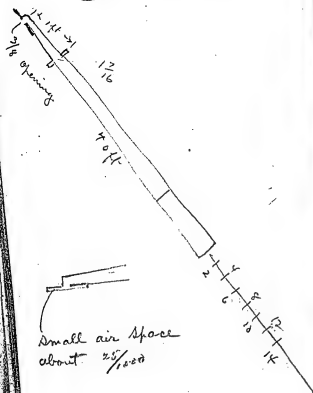
Standard Recorder - 40 ft Horn

4 ft ok for coral (and) quickly nat
as good as it should be +
6 ft ok for coral and underneath

Page 29

Shall lower vol at 6 ft not much
difference in quantity -

✓
31 24 per, long horn, $\frac{3}{8}$ openings
steeper angle, small air space
6B Wegman 15%



6B

32

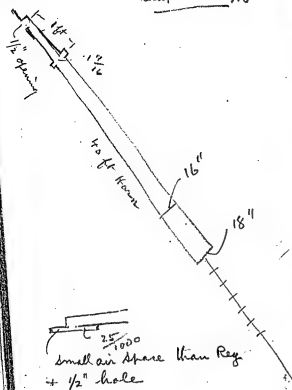
Not as loud - Considerably
less loud at 6 ft -
Quality better all three

(Compare with Reg Recorder &
Page 29

Page 31

Not as low - considerably less found
at 6 ft - Quality better all
than

33) 8 ft horn, $\frac{1}{2}$ opening
 steeper angle at small end
 7B and small air space
 diameter $1\frac{5}{16}$



Small air space than Reg
 + $\frac{1}{2}$ " hole

Seem louder than $\frac{3}{4}$ opening
 Quality about same

34

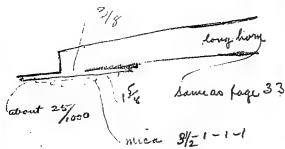
7B.

Louder than regular all thru
 + quality a little better
 should say that at 6 ft
 it would be ok loudness
 for most instruments
 weaker ones could come
 nearer + louder ones
 further away

Page 33

London than Reg all these &
probably a little better should say
that at 6 ft it would be OK
loudness for most individuals
workers ones could come
nearer a London one
further away.

35/ 8 $\frac{1}{2}$ in, long horn $\frac{3}{8}$ opening
 steeper angle at small end
 8B and small air space
 and $1\frac{5}{8}$ diaphragm



Kissells
 See page 44

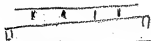
36

8B

Volume 55% of Reg. but -
 Quality very great improvement,
 its more muffled & has a
 peculiar reinforced note
 which comes at times
 but quality is greatly improved
 should say 100% improvement
 some thing is in line with
 one note.

Different thickness of wire
same length

Book says 4 post thin wire



F. 135

Book say short wire
is sharp + ~~loss~~ melbrow

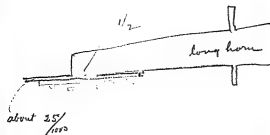
Real short wire

Page 35

Volume 95% of Reg but
quality very great improvement
its more muffled & has a peculiar
reinforced note which comes
at times but quality is
greatly improved & would
say 100% improvement
Something is in tune with
one note

37

9.B. Same as 8B. except
opening which is - $\frac{1}{2}$ "



38

9B

105% loudness of Regular
The quality is not up to
page 35, but it far better
than regular in fact no
comparison

It amplifies one note (base)
but not so strong as 35

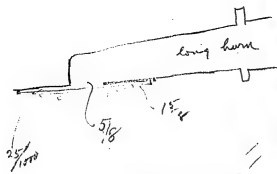
Page 37

105% loudness of Req-
The grade is not up to 35
but its far better than Regular
in fact no comparison

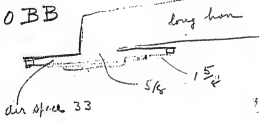
It amplifies 1 note (6 are)
but not so strong as 35

✓
39.

10B Same as 8B + 9B
except daming which is $5\frac{5}{8}$ "



10BB



This is louder + fuller than Reg

10 BBB

Same as - 10BB but gasket on
end - for bigger air space
Results - loud as 10BB but fuller

48

10B

Little louder than Reg
sharper than 37, quality
not so mellow
Reinforces that same note

Page 39

little louder than frog

Sharper than 37.

Quality not so mellow

Therefore ~~that~~ same
note,

41

Conclusions with cotton

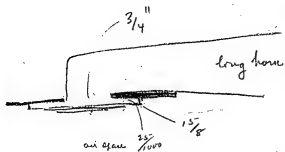
1 1/2 Sheehan 100% = perfect

Opening	Experiment	Sound	Time	
3/8"	8B ✓ page 35	73	81	} same machinery
1/2"	9B ✓ page 37	76	79	
5/8"	10B ✓ page 39	78	81	
Reg. 5/16"	no wire	80	80	
3/4"	11B - page 43	76	83	} 100% model
3/4"	12B - page 45	80	82	
5/8"	10 BB page 39	80	83	
5/8"	10 BB page 39	82	85	

8 days page 45 best
 1 37 } next
 4 39 }

✓
43

11.B. Same as 8.B
except opening which is $\frac{3}{4}$



11.B

90% loudness of Reg

Quality not as good as ^{page} 35

but better than Reg
don't hear the reinforced note

Page 43

90% of Condensers of Reg

Quality not as good as

35. but better than Reg

don't hear the reinforced nite

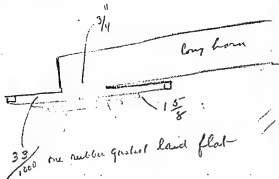
45

Jan. 10, 19

12B

Found that 11B - $\frac{3}{4}$ " opening
was very good quality

Try larger air space to get
at low down



not quite as loud as
go. $\frac{5}{8}$ " opening with same
air space
Quality about same.

See page 11

tried this again +
found $\frac{3}{4}$ " opening a
shade louder than
 $\frac{5}{8}$ "

46

12B

Lowest yet 115 to 120
Quality better than Reg

not so good as page 35, but
if muffle a little would
probably equal it

Has no reinforcement of that
base note

Page 45

Lowest yet 115 to 120%

Greatly better than Reg -

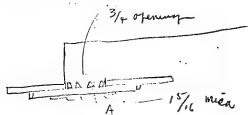
not so good as 35, but
if muffled a little would
probably equal it

Has no reinforcement of
that base Note.

46

13B

Same as Regular except -
the perforated plug A.

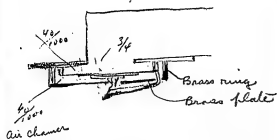


This was very much
weaker than regular

N. G

47

48



Tried air chamber below
diaphragm as above

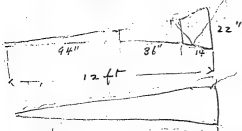
Results - was much weaker
+ muffled + lacked definition
when compare with out-
lower air chamber

49

50

Horn Comparisons, Reg. Recorder

compared long 40 ft horn
with



Short horn is loudest
+ fullest

Seems to be a slight difference
in quality, long horn sounds
more distant

tried comparison at 4 ft. +
6 ft away - short was
loudest in both cases

1 st trial	70 ft	4 ft away
2 nd "	40 ft	4 ft away
3 rd "	12 ft	6 ft "
4 th "	40 ft	6 ft "

Made this again, notches are reversed
in 2nd trial.

51

1st 12 ft Horn - 4 ft -

2nd 40 ft Horn - 4 ft -

little louder than 1, but same
quality

3rd Short - 12 ft - Horn 6 ft - X

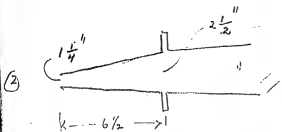
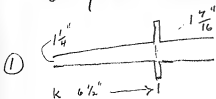
Louder than 4, but quality
cornet of any heard

4th 40 ft Horn - 6 ft -

Quality cornet not as good

52

Long horn, different end

Both use with $\frac{3}{8}''$ opening diaphragm

#2 was a little louder than
 #1, but very poor sharp tone

53

54

5" Recorder

#1 (5"-A)



Tried diaphragms 7-2 1/2-2 1/2-2 1/2

+ 12-3-3-3 + 16-3-3-3

the last one was best + was used
in following experiment5"-A was very weak
diaphragm was useless#2 (5"-B) as above but 5000 an
apex instead of $\frac{32}{1000}$
very much weaker than #1#3 (5"-C) same as #1 but $\frac{57}{1000}$ an
apex - louder than #1 but too weak#4 (5"-D) same as #3 but short
arm
two louder

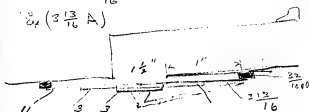
55

2.
Hardly hear these

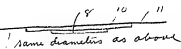
Page 54 —

Handy near them

56

 $3\frac{13}{16}$ - RecorderEx ($3\frac{13}{16}$ A)

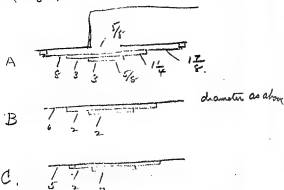
Fouder than 5" - but too weak

Ex ($3\frac{13}{16}$ B)Ex ($3\frac{13}{16}$ C)

did not try these two as
the variation of diameters
on page 58 showed so little
change

57

60

 $1\frac{7}{8}$ - diaphragm $E_k(1\frac{7}{8} A)$ $\frac{5}{8}$ - opening

Kasullo A was very weak

B shade louder

C - was loud + fuller than A or B

C. was fuller than regular, +
or shade weaker

Compared with 10 B B page 39

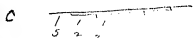
C is weaker + fuller

This shows that with $\frac{5}{8}$
opening - $1\frac{7}{8}$ dia is better
than - $1\frac{7}{8}$

61

Loudness Commercial Distance
judge between 4 + 5 ft.
say 5 ft.Correct nearly natural but
still same wave

62

1 $\frac{3}{4}$ diaphran(Ex 1 $\frac{3}{4}$) $\frac{5}{8}$ opening

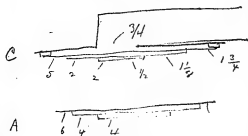
- C is louder + clearer than A
 C is louder than - page 60-C

C compared with 10 BB. page 39
 shade weaker than page 39
 but very little
 ? as to which is best I
 prefer 1 $\frac{5}{8}$

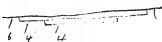
63

only Commercial bond at 4.4-
 6 much too weak
 variations of volume on sustained
 notes of Cornet much less +
 quality of Cornet very much
 more natural.

63

 $\frac{3}{4}$ opening
 $1\frac{3}{4}$ diaphragm


A



A - much weaker than C.

C is weaker + fuller than ^{12B} page 45
 which is $1\frac{5}{8}$ diaphragm + $\frac{3}{4}$ opening

D



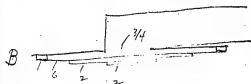
D is louder than A, B & C
 shade weaker but fuller than $1\frac{5}{8}$ diaphragm
 $\frac{3}{4}$ opening Page 45 -

64

Not as loud as page 7.
 Volume at 6 ft. too weak for
 commercial work.
 Irregularity on surclamped notes
 notes very great, on the whole
 much so that cannot sound
 entirely unnatural

65

$\frac{3}{4}$ opening
 $1\frac{7}{8}$ diaphragm



C



B is much weaker than C
 C is ~~weaker~~ + fuller than $1\frac{3}{4}$ diaphragm
 about same hardness as $1\frac{3}{4}$ C page 63

66

Commercial OK at 6 ft.
 but corner some what
 unnatural + wavy.

67

Feb 7th 1920
 Conclusions to date

1 5/8 diamfram best diameter

2 5/1000 air space - N. g

filad greatest (33/1000) air space is always better
 than 25/1000 " space

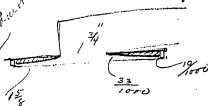
between 5/8 + 3/4" openings
 after several trials 3/4 is lowest

68

69

Air Space Experiment

Standard



the piece inserted in air space
with gap at one edge

Result this is louder & fuller
than page 45 - 12 B. which is
without above plate

70

20% louder (than page 45) 6 ft away
loud enough for commercial
Quality Power

Page 45 sustained note on
cornet steady

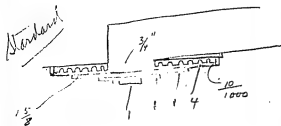
_____ Volume

on 69 _____ Volume
This phenomena occurs in lots
of our records & I cannot understand
how it is possible to vary the volume
on a constant-volume sustained note

If recording machine varies in each
revolution, but always about 80
per min when times this would do it

Means that if this volume variation
was regular at 80 rev. it might
be the machine, monitor or earphones

91

Air Space $\frac{3}{4}$ opening
 $1\frac{1}{2}$ dia

this inserted in air space
with gastail on edge

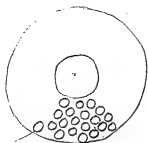
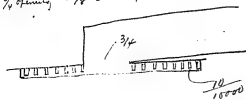
- Recalls about same as
page 69 might be a little
fuller

92

Looseness same as 69
looseness at 6 ft. thick enough
for Commercial work
Quality a shade better
I think correct sustained bolt
still wavy

73

Air Space

 $\frac{1}{8}$ opening 15% built up mass

disc inserted in air space
 full of $\frac{1}{8}$ " holes in act as dash pots

Results weaker than page 69 or 71

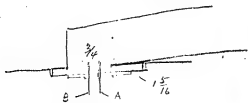
~~74~~

74

not quite as bonded in top
 as 71, not bond enough for
 commercial, similar to 71
 good as 71, but small difference

75

Off Center

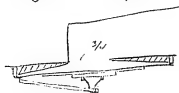


try mounting diaphragm $\frac{1}{8}$ off
 Center with foot of arm at B
 also with foot of arm at A
 when compared with regular
~~on~~ mounting, ~~it~~ neither A or B
 showed any improvement,

76

77

Arm Experiment

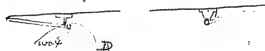


A

above same combination as page 69
except arm with is tube type

B

as above but arm cut and
used as follows



C. filed to a delicate joint @ D.

78

A



B.

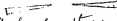
is louder than A

but both corners are wrong

79

Conclusion to here

Page 45 - $1\frac{1}{8}$ dia $\frac{3}{4}$ opening
louder than Reg.

Page 69 same as above but
air space 
this is 20% louder than 45

Page 71 same as 45 but air
space ~~more~~ ~~more~~ same
louder as 69, quality better

Page 77

Say new arm is louder. I

Page 50

Say 12 ft horn is louder
+ better quality

80

Compared Reg. ulna Recorder
with improvement
to date which is

Reg. Recorder

Page 69

1st trial - Reg. Recorder

2nd trial - $1\frac{1}{8}$ dia page 69

2nd is loudest. say 20%
(C)

Horns

Same comparison as Page 50
but in following Position

1 st tree	40 ft horn	2 ft away
2 nd "	12 ft "	2 ft "

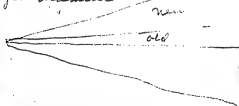
3 rd	40 ft horn	6 ft away
4 th	12 ft horn	6 ft "

1st slightly louder

4th slightly louder

Mr. Edwin

very little diff. in between
these horns, suggests that
40 ft horn, could have a
steeper angle & make much
bigger diameter



83 2?

N. Y. Comparison
of (page 69)
Big den $1\frac{3}{8}$) + Reg
With Raffield Horn
+ Geo Ballard

1st trial
Reg den (wire) 6" away

2nd Big den 6" away
| These muffed not as loud
as #1

3- Big den 10" away
| sounds weaker than #2

3 to show 2

84

148

85

Comparison of Reg +

Reg Dick (p. 69) with 40 ft horn
with Geo Ballard

1st Trial - (Reg Dick) ^{wire} 10" away

2nd Reg Dick (wire) - 10" away

2nd Best - cleared - #1
has horn sounds though at
loudness about same

(duplicate
see page 87 + 89)

86

87 ^v New Ballard in Person
Py. dia (wire) & 40 ft Horn

1 - 6" away

2 - 10" away

3 - 14" "

4 - 18" away

Better than #4 page 89
thinner quality loudness
if anything a shade weaker

(S)

note
see top 89

E. says

88

1st loud - 70° can hear but not clear
muffled not clear lot of repetition

2nd loud 67° - clearer & more enjoyable
hear some words still muffled some

3 loud 65° - clearer not so muffled hear
3/4 of the words more pleasing

4 loud 63° clear - bk not muffled
natural

Page 87-

(3)

Ray Her

1st ~~70%~~ 70% Can't hear but little music -
6" Muffled & not clear. Lots of
reflections.

2nd 67% Clearer & more enjoyable
10" hear some words - still
muffled some

3rd 65% Clearer not so muffled
14" hear 3/4 of the words
more pleasing

4th 63% Clear - ok not muffled -
18" natural

89 ^{1/2} Gen Ballard in room
Big Alia (Page 69)
+ 4 off Horn

1st = 6" away

2 - 10 - away

3 - 14 away

4 18 away

(2) for comparison of vocal
on 1/3rd + 1/4th recorder

90

E. says

1st loud - 70 not so muffled quality
Hear the words quality fair

2nd loud 72 - little better than #1 in
quality loud + less muffling

3 loud 67° not as good as #2

4 " 66° " as good as #2

(3 1/2)

Page 89-

New Wes

1st 70% - not so muffled greatly -
6" hear 1/2 the words - quality fair

2nd 72% little better than 1st in
10" quality, loud - less
muffling -


3rd 67% - not as good as 2
14"

4th 66% - not as good as 2
16"

91 2^v

Ballard Beach + Phone

6" away Land Tree

A  70 70

sounds distant

B.  70. 70

Same as A

C.  75- 60

Not so distant-
+ louder + sharper

(8)

To show what is
better on short horns

92

I say

A loud - 70 only fair

B " 68 quality good

C " 75 quality not so good
as B.

Page 91-

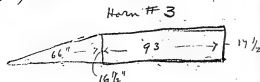
(4)

A. 70% only fair

B. 68 — quality good

C. 75 — quality not so good
as B

93 $\frac{1}{2}$ Ballard record



Compare above Horn with 40 ft Horn
with Ballard Record - 4 ft away

1. Recorder #60 + Horn #3

2. $1\frac{3}{8} + \frac{3}{4}$ recorder page 69 + Horn #3

X

3. Recorder #60 - 40 ft Horn

4. $1\frac{3}{8} + \frac{3}{4}$ recorder page 69 + 40 ft Horn

(Σ) for above

Phon meter 2 loudest 40

4 next - 38-40

3 next - 35-

1. weakest - 30-

94

Compare 1 + 3 for horns, 1 was
loudest + not so muffled as trial 3

Compare 1 + 2 for recorders. #1 was
shade louder + clearer

Compare for horns #2 + 4 - two as loudest
+ not so distant -

2. Days -

1. at level 70 quality not very good
music faint, OK for Comel Volume

2. at level 85 quality much better - hear
words OK + some of music, louder
than Comel necessary

3. level 68° quality fair not so good
as #2

4. level 68 not so good as #3
would say it bad
2 is best + loudest

Page 93

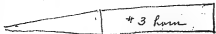
1st 70% - quality ^{ok for Council Valen} not very good More faint

2nd 85% quality much better near words
ok & some of words - louder
than Council necessary.

3rd 68% - quality fair, not quite so good
as 2 -

4th 68% - not so good as 3 -
would say to be -
2 is best & loudest

95 $\frac{1}{2}$ Band Records
same tests as page 93



Horn + Recorder Comparisons

Goals

1- Reg.
Recorder # 60. Horn # 3

2 - $1\frac{1}{2}$ + $\frac{3}{4}$ page 69 Recorder Horn # 3
X

3, Reg-Recorder # 60 - 40 ft Horn

4 - $1\frac{1}{2}$ + $\frac{3}{4}$ Recorder + 40 ft Horn

Rhino meter 2 loudest

3 next

1+4 same + Weakest

96

Compared 1 + 3 for horns with Band loudness about the same, 3 has no high sounds, at all bottom, if any difference in loudness #1 is.

Compare 1 + 2 for recorders loudness about same, #2 is bottom heavy.

Compared 2 + 4 for horns. 2 is louder + not so distant

Shows that each results are for volume ~~and~~ different.
from vocal see page 93

E, Days

1- loud 70 Cornet loud enough pretty fair quality

2 loud 85 but Melody waves (Cornet)
quality poor, loudness brings out defects

3 loud 68. Waves a little more so conspicuous, quality whops a shade more pleasing than #1.

4- loud 70. Waves a little but more than 3 quality fair about same as #1, There is a resonance some where in this on Cornet

Page 95

✓ mixed

①

1st 70% - Cornet loud enough - pretty fair quality

New Horn

Reg

2nd 85% but mellow ~~Waters~~ (Cornet) greatly poor
loudness & bright and effects

New Horn
Now

3rd 68% - waves a little not so conspicuous
quality perhaps shade more
pleasing than No 1 -

Hoff horn

4th 70% - waves a little but more than
3 - quality fair about
same as 1 - There is
a resonance some where in
this on Cornet,

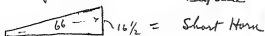
Hoff

97

See page 99

High & Low Whistle

Big area



Whistle 1 ft away -

1st High Whistle Short Horn2nd High Whistle 40 ft Horn3rd Low Whistle Short Horn4th Low Whistle Long Horn

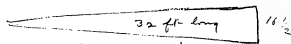
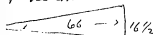
With high whistle short horn
is much louder

With low whistle loudness
about the same, in long horn
the tone is softer whistle muffled

Will not show this
as page 99 is same thing
& horns opening are same diameter

98

99 ²/₁ Comparison of
High & Low Whistle
with Ray 1 7/8 recorder
& horns below, Whistles 12" away



1. M¹ High whistle 32 ft horn
- 0 - Phono Meter
2. M² High whistle 66" horn
louder than #1 Phono meter - 0.
3. M³ low whistle 32 ft horn
louder than 4 - Phono Meter 55
4. M⁴ low whistle 66" horn
Results Phono meter 90
in short horn higher whistle
is louder, in long horn
low whistle is louder.

E. rays

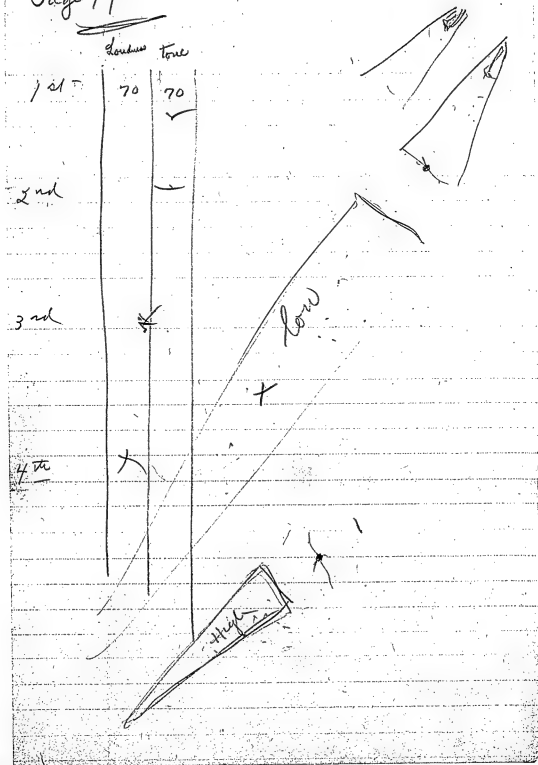
Can not hear the high
whistle, but get a louder
whistle

Phono meter will not register high
whistle

By ear the low whistle is
loudest with trial # 3 long horn
with Phono meter it is reversed
short horn is loudest,

Page 99

(5)



101

ΣPointed Arm Recorder $1\frac{5}{8}$

Band Record - 4 ft away

 $1\frac{5}{8}$ - $\frac{3}{4}$ away

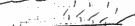
1st trial

best $1\frac{5}{8}$ recorder to date page 71

2nd trial, everything the same
except arm which has pointed
first & no facts

This is louder & fuller
than #1

(3)

try above 
 $1\frac{5}{8}$ to be .001 instead of .004

This is much louder than

2nd trial above 4-1-1-1. + most
anything to date, cut is rougher
but think it feasible

See page 117

102

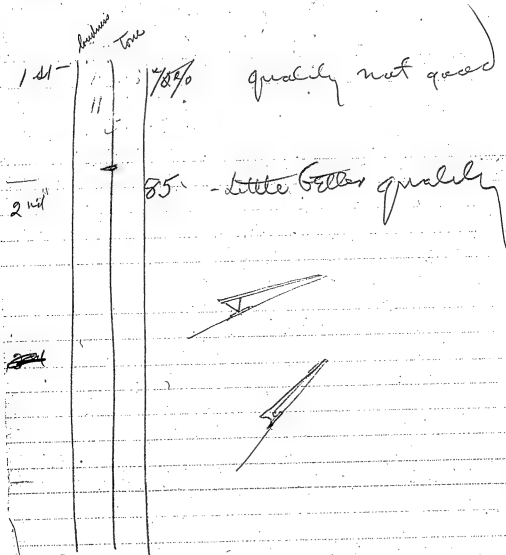
Σ say

1 loud - 70 quality not good

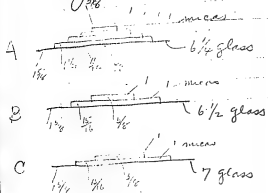
2nd " 85 little better quality

Page 101

(6)



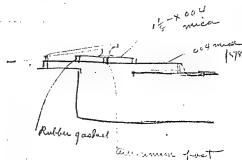
103

Glass Diaphragm $1\frac{1}{8}$ 

	Load	Time
A	68	70
B	68	68
C	65	65
Standard	70	70

Glass are too thick will
try + get 4 or 5 thousand
thickness

104



Much weaker than standard
base seem much weaker although
it is not this time

105

21

Comparison of Plans

on $1\frac{3}{4}$ Rec. + Reg Rec #64
with #3 horn page 93

1st Reg #64 Rec. Long Plans horn
2" away - Reg way taking Plans

Best? See #3

2nd Standard $1\frac{3}{4}$ Rec page 71
with #3 horn page 93 - 4 ft away

Fuller than #1 - more uneven
middle of Plans - notes ^{more} explosive than #1

3. $1\frac{3}{4}$ Rec - $\frac{3}{4}$ timing - mica 1-1-1-1
pointed arm - #3 horn 4 ft away
see page 101 - ③

This is louder + fuller than any
of above + as even as #2

Question between this + ③
will try further

106

Object of Comparison to compare results of New
apparatus to date, with Regular methods
of recording

Results so far seem to show that nothing
is gained by ~~direct~~ working a distance from
horn, when you get horn + recorder
sensitive enough they seem to respond
to any further note which make uneven
records

Ex says

- | | | |
|----|---------|--------------------------|
| 1- | loud 70 | fine quality |
| 2 | " 68 | quality no so good |
| 3 | " 70 | quality not as good as 1 |

(7)

Page 105

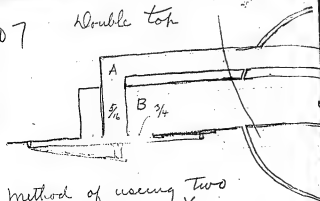
	1st	2nd	3rd	
	1st	2nd	3rd	40% fine quality

2nd				68- quality not so good
-----	--	--	--	-------------------------

3rd				78- quality not so good 101
-----	--	--	--	--------------------------------

107

Double top

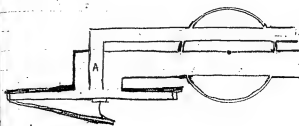


Method of using two
horns without a Y
to see if it is louder

Distance A is very much
weaker than B
tried bringing A close to diaphragm
to get at louder results was
weaker
tried different distances as far as
 $\frac{1}{8}$ " - $\frac{1}{16}$ " is as good as any.

Played Phonos 4 ft away into
2 horns connected with above
top + compared with
Regular recorder under same
conditions with Y + same style
horn - The Y outfit was
much louder.

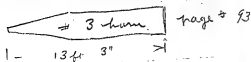
108



See Page 131

109 (c)

Horn Comparisons



Soundness about the same
" 2 horn is considerable fuller

Seems to show that if you
wished to get a thinner tone
you can do so by using steep
angles at the small end

No sample

110

III

C/


Harp trials

Comparison of N.Y. & Col. Studios

1st - N.Y. with 16 R.H. horn
6" away, horn following the flange

2nd Col. Studios #3 horn page 93

Rec - page 71

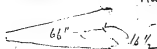
Harp 20" away 

N.Y. is louder & less muffled.
Did not show - 2

113 G

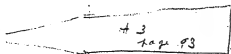
Harp birds + Harp Comparison
Recorder page 71
Harp 20" away

1st



1st section of #3 horn page 93

2nd



#1 best shade louder & less
muffled

114

E. harp

1 - Best loudest

2nd not so sweet, sharper

Page 113.

8 ⑥

	Loudness	Time	
1st	70	70	70% Beet - Loudest
2nd	65		not so sweet 2nd not so loud - Sharper

115

Harp trial - #3 horn page 93
 (Recorder tape 105 "3 - 198 - pointed arm
 1-1-1-1)

1st trial	4 ft	} as loud as N.Y. male fuller, bleats heard in middle of harp. G.A.B. weaker than N.Y.
2nd "	8 ft	
3 "	8 ft	

Cords rattle single wire OK.

Acoustic
 see page 119 + 120

116

117

from page 101

Harp Recording

Same Recorder as ③ page 101
 found this recorder rattled
 on harp - tried diagram 3-1-1-1
~~at 3-1-1-1~~, 2-1-1-1 was
 best and louder than page 71
 but it still rattle a little
 tried 3-1-1-1 this is only shade
 if any louder than Page 71

118

119

Harry Comparison
with Sim Recorder page 117 - 2-1-1

3 horn

1st trial	20" away
2nd "	36 "
3rd "	48 "
4th "	60 "

2 says

- 1 100% too loud
- 2 80% Com'd
- 3 92% Poor Swell not level
- 4 88 - not good

Σ 120

Same as opposite page
except Horn

Horn $\frac{11-66-11}{11-66-11}$

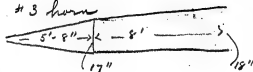
1st trial	20" away
2nd "	36 "
3rd "	48 "
4th "	60 "

These are more brilliant
and less muffle than page 119
and just as loud

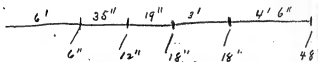
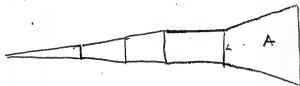
not heard by 2

121

#3 horn



#4 horn



Compared above with Stated Rec
Page 71

at 2 ft with Phonograph
#4 horn was weaker & muffled

at 8 ft, both were about same
loudness but #4 was very
thick tone

E says

122

#3 horn

- 1 two loud
- 2 Corn'd ok loud
- 3 little below Corn'd loud
- 4 weaker but not much

#4 horn

- 1 not so loud as 3, much better quality
 - 2 loud Corn'd quality ok,
 - 3 Commercial
 - 4 shade lower than Corn'd
- all much better quality + doubt-
less volume as much as you
go away from funnel as #3

Page 121

7/10/20

#3 Horn
1 Too loud -

2 Commercially OK horn

3 Little below Council loud

4 Weaker but not much.

#4 Horn

1 - not so loud as 3 but immediately quiet

2 Good Commercial Quiet OK

3 Commercial

4 Shade lower than Council

all much better quality

& don't lose volume as
much as you go away
from funnel as NO 3 does

128

Horns

Comparison with # 3 horn
and # 4 horn with out
bell A, Page 121

Phoned use 4 ft away
with Standard Rec, Page 71

4 was considerably better
loudest + fullest-


E. Says


- | | | |
|---|-------------------|-------------------------------------|
| 1 | corn'l loud | } Poor
Quality
Sharp
Nasal |
| 2 | ditto about Right | |

Recorders

129

1 - Standard Rec Page 71

2  $1\frac{5}{8} \times 1\frac{5}{16}$
4-1-1-1 - mica

3 as above but arm turned
other way 

Standard is best #3 loudest but poor
nasal quality

E. Says

- | | |
|---|---------------------------------|
| 1 | } Not much difference
in Vol |
| 2 | |
| 3 | |
- 3 Strongest -
all sharp

7/10/21

Page ~~123~~ 123

- #1 Counsel (land)
- #2 ditto - about right
- } poor
quality
sharp
muscle

Page 124

- 1
- 2
- 3
- } not very much dif. Val
- 3rd strongest
- all sharp -

125

#1 Standard Rec Page 71
#3 horn#2 as above drawing
#3 hornResults #2 is weaker & too full

E - says

- | | |
|------------|--------------------------|
| 1 - Cornel | } very little difference |
| 2 - Cornel | |

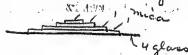
try cleaning using stick to rub side
 of stone, results are weaker & then time
 it was cleaned to be

126

Daphnamb,

#1 Standard Rec Page 71

#2

Results #2 louder, fuller & better
than StandardBrookwood tried another, results
New glass & -1-1-1 much better
Standard

Page 125

#1

Conch

#2

Conch

Very little diff

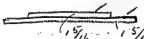
sharp

7/10/20

127

Diaphanous

1- standard Recorder Page 71

2-  all glass

Soundness about same
#1 quality best

E days

128

Dome



4-1-1-1-1 mesh
1 5/8

Compared above with Hand Page 71
above was weaker, fuller + less
definition,

E - days

129

Basket Ex.

K-1-1-1-1
med

Compared with Standard Page 71
it was just as loud & not
so solid tone.

 2 days

130

Cork



K-1-1-1-1

tried above with & without cork
cork seems smooth
loudness the same, tone may have
been higher with cork?

 2. days

131

Double Recorder July 17, 20
from Page 107



1. made a test with Phone with Standard recorder & horns + Reg Y



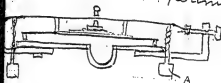
2. made same test with double recorder using the same diaphragm needle + gasket.

#2 was shade weaker wire about the same.

Conclusion that there is nothing gained by this recorder probably could be made to work as good as Reg Y, but if so, could not use the diaphragm, also, instrument playing to the center entrance would have to be closed + the entrance is the weakest.

132

Wire experiment -



1. made test - Reg adjustment with 2 feet

2. as above, but screw to lower $\frac{1}{2}$ turn to put pressure on dia phram, also loosen wire

3. same as 2 but wire tightened, about same tension as #1

Results	load	time	} shows that - large facts are weak pressure on diaphragm make record better and weaker
1	70	70	
2	71	72	
3	69	71	

- Try same experiment above, but with out facts wire fast to arm

1. Reg tension wire fast to arm
2. A unscrew $\frac{1}{2}$ turn + as above
3. same as #2 - this wire tightened

Results	load	time	} Results seem to be same as with facts
1	70	70	
2	72	72	
3	69	72	

133

Diaphragms $1\frac{5}{8}$

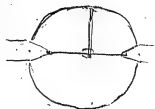
Compare with $\frac{3}{4}$ opening Holder.

① 4-1-1-1-1 mica

② 4-1-1-1-1 "

#1 is best - loudest tone about 500

Short wire 1" long 134



above built same as standard but without fasteners
 since 4-1-1-1-1 mica, same was louder than standard.

They tried with fast $\frac{1}{2}$ " apart
 result very much with Poole

135



Comparisons

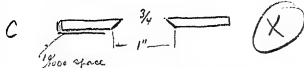
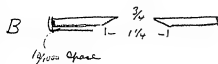
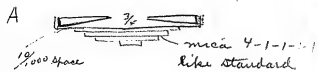
- 1 Standard page 71 - mic 4-1-1-1
 2. 4-1-1-1 mic, balance like Standard
 - 3 glass reflector as above
- | | | |
|---|------|-------|
| | loud | write |
| 1 | 70 | 70 |
| 2 | 80 | 80 |
| 3 | 90 | 90 |

This is loudest recorder to date
 does not make any difference
 on old $\frac{5}{8}$ opening, but when
 you have a big surface - loud.
 $\frac{3}{4}$ opening results are different

136

K. H. H.

137



Compared the above air spaces

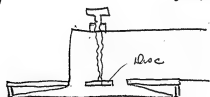
	low	time
A	70	70
B	65	70
C	63	70

[Handwritten signature]

138

139

July 27, 20



		loud	high
A.	$\frac{3}{8}$ disc flush with Holder	70	70
B	$\frac{3}{8}$ disc 6 turns closer about $\frac{1}{1000}$ from diaphragm	72	72
C	no disc	72	75
D	$\frac{1}{4}$ in disc flush with Holder	70	70
E	$\frac{1}{4}$ disc 6 turns closer about $\frac{1}{1000}$ away from diaphragm	72	72
F	no disc	71	72

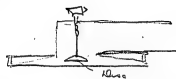
B is louder than E.

Trid $\frac{3}{8}$ disc different distances
from 1 to .005 as best (This is good)

See page 141

140

141



A $\frac{3}{8}$ - .005 away land lowe
70 70

B - $\frac{1}{2}$ - .005 away 72 72

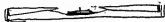
C - $\frac{1}{2}$ - .014 away 71 - 72

$\frac{1}{2}$ at .005 away, seems best
but within say $\frac{3}{8}$ is.

Compared loudest recorder to Dale

P Reflector page 135. 70 70

Reflector Recorder with $\frac{3}{8}$ disc .005 away X loudest to date

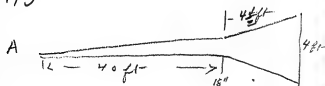


72 - 65

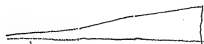
Standard Recorder 65 - 65

142

143



B



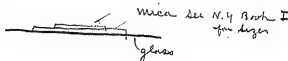
Horn #4 page 21 without flange

B is louder at 2 ft + same loudness as A at 8 ft

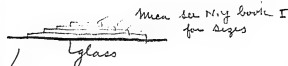
A is in all cases is muffled
into brass with soprano,
both blasted easily

144

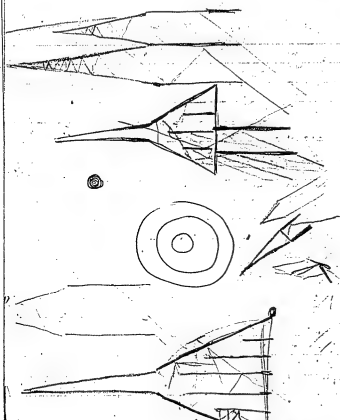
Glass Diaphragm 15/8



thin wire - not good



Coarser + fuller than standard
page 135 #3



	Time	low	
1	70	70	X
2	71	72	explosive
3	68	68	5

Standard	Readers	time	Roughness
1 ^{H=1/4-1}	70	70	70
2 ^{H=1/4-1}	80	71	75
3 ^{glad} ^{Werner}	75 X	68	78-?
4 ^{glad} ^{Werner}	71	71	72
5 ^{reflector} ^{H=1/4-1}	90	90	
5 F			

[ITEM(S) FOUND IN BOOK]

Dec/ 29, 1919.

Mr. W.C. Miller Attached find Mr. Wilson's comments on the last records (23 - 34) made in the Columbia St. Studio. When you have finished with them kindly return so that we may file with the previous ones.

You will note that he desires to have the regular opening tried (which he calls 3/8") and also another trial with the 1/2" opening when the air chamber has been loosened.

Would suggest you have Frank make up the steep 12" and please for the regular opening, also a regular regular form to which diaphragm can be transferred, then we can give him sample of 1/2" against regular using same diaphragm as we did with the 5/8" against the 1/2".

Kindly let me hear from you regarding the above so that I may tell Mr. E. it is under way.

Geo. J. Warner.

per F.C. Bart.

(12)

[ITEM(S) FOUND IN BOOK]

DEC 29 1919

Werner

Please diminish the chamber
on the $\frac{1}{2}$ opening more



chamber



chamber

& take accurate record

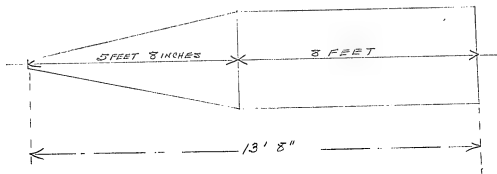
[ITEM(S) FOUND IN BOOK]

HORN NO. 3 is

$14\frac{1}{2}$

18 INCH

18 INCH



JUL 3 - 1920

HORN NO. 4 is

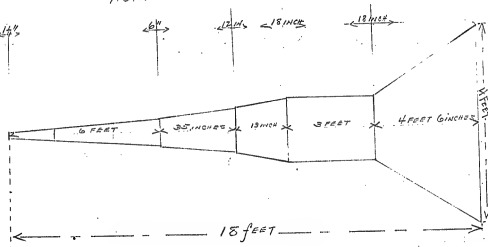
14 1/2

6"

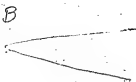
12 IN

18 INCH

18 INCH



[ITEM(S) FOUND IN BOOK]



1- A - 2 ft away
B - 2 ft "

2- A - 4 away
B - 4 away

3- A - 6
B - 6

[ITEM(S) FOUND IN BOOK]

Trials # 13 Jan 27/28
 Recorder #1. Lauter Pairs.
 3 1/2 ft. ~~177~~ 9/10
 with Pseud. haph. 8-11-12-14-15

1st Trial ——— High Free
 Can't hear tracking but it's weak
 Recording

2nd " just hear tracking With Wires
 Record 50% Louder & OK

3rd " 40% Louder than 1st Stay at end of Arm.

4th " just hear tracking but tracking (weaker)
 than 2nd " " Club's Legitimise
 more,

Pseud.



Trials # 13 Page 44

**Notebook Series -- Notebooks by Edison and Other Experimenters
Group 4: Navy and Wartime Research Experiments (1917-1918)**

These three notebooks were used during the period February 1917-March 1918 for experimental work for the U.S. Navy and other wartime research performed at the behest of Edison. Other authors include E. Rowland Dawson, William Deans, William A. Hayes, Absalom M. Kennedy, and Henry G. Wolfe. Some of the entries relate to night visibility tests to help rangefinder users develop more sensitive night vision for spotting submarines. Other experiments pertain to the use of sound recording for submarine and torpedo detection. There are also notes on experiments with kite rudders for Navy ships. Related material can be found in the Naval Consulting Board and Related Wartime Research Papers, Special Collections Series.

N-Number

Labels and Inscriptions on Front Cover

Selected Books

17-02-06.1	----
17-08-25.1	----
18-02-21	----

**Notebook Series -- Notebooks by Edison and Other Experimenters
Navy and Wartime Research Experiments
Notebook, N-17-02-06.1**

This notebook was used during February 1917 by Edison, E. Rowland Dawson, and Absalom M. Kennedy for notes pertaining to Edison's work for the U.S. Navy during World War I. Also included are notes on recording experiments similar to the material in N-16-11-13 and N-17-01-06, Notebooks by Edison and Other Experimenters—Recorder and Recording Experiments—Miscellaneous Books. The book has been used in both directions. Taped between the inside front cover and the flyleaf are two pages of notes by Dawson on submarine signaling. These are followed by notes by Edison and Kennedy on experimental recordings and recorder tests. Following the recorder tests are notes by Dawson on "Submarine Night Visibility Tests" and on an "Extension Ladder to Waste Baskets" for use aboard ship. At the other end of the book are several pages by Dawson regarding a visit, ordered by Edison, to a doctor in New York City for eye tests. These tests were undertaken in connection with the search for methods of keeping the pupils of rangefinder users dilated for more sensitive night vision. Additional information on these night vision tests can be found in N-17-01-20, Notebooks by Edison. The pages are unnumbered. Approximately 30 pages have been used.

6955
Acme, Co.,

MFG. STATIONER,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Submarine Signal Co.

Receiving Apparatus consists of
2 tanks on fore peak of vessel
as far below water line
as possible, one on port
side, the other on starboard
Wires run to battery and thence
to indicator box

In each tank (16" x 32" x 8")
are two microphones immersed
in water, which receive sounds
coming through water and striking
sides of vessel.

Two telephone receivers, one
for each side of vessel are
used on Indicator.

Above used very successful
for fog signals. Bell struck
by compressed air, heard 16 miles
at British Naval test

(Submarine Signal Co., Boston
+ 68 Broad St. New York.

(Pamphlets on Submarine Signals
Allingham Ton - Submarine Signaling
Poggiano - An Italian paper.

Estroza - a Spanish "

Fay, N. J. W. - Paper for American Electric Engineers

Elison H.R. - Article in Technology quarterly.

Segreude - a French paper

Miller - Marine Engineer

Mundy - Triangular Location stuff

Packard of Boston - Paper

Schubert - a German paper

Talbot F.A. - London Works Work

U.D. Hydrographic Office paper 1909

Wolf - a German paper

SEXTET

Soprano & Baritone too low
Drum too sluggish -
And bring out each
singer clear -
Too much confusion
in it - There is a
shaker in it ;

BACH AIR

Base entirely too
weak, should
dominate —
heard one blue

FUNERAL MARCH
BEETHOVEN

Blubs - Bass too
weak -

all too weak -

There is a high in this
that I don't understand

PIANO TEST

a) Regular

No swell no overtones

b) Bottom Board replaced
by cow hair.

No swell no overtones

TRUNION TEST

a) Tapered
(Tapered recorder also)

b) Straight
(Standard Recorder #100)

Very little difference -

Something wrong in
both -

RECORDER TESTS

100 - Standard

107 -

121 -

8 -

2 -

3 -

4 -

1 -

Make these tests
8 feet from the horn

RECORDER TESTS

7 -

5 -

①
Recorder & Head X
Voice Dawson

Record ^② E Head X
Violin

③

Recorder & Ideal
Piano

(11)

Reorder 5 - $1\frac{1}{2}$ " Violin

① Small tube

② Regular $\frac{3}{8}$ " tube

③ $\frac{1}{2}$ " tube

Ring ⑤ Violin

① Head X - diminishing taper

② Head Y, Expanding taper

③ Head Z Expanding rounded taper

Rearden Tests at 6'

① 100

AZ

BZ

CZ

② AZ

EZ

FZ

1Z

③ 2Z

3Z

4Z

5Z

Reorder Tests at 2'

⑩ 100

1Z

2Z

3Z

⑪ 5Z

6Z

AZ

BZ

⑫ CZ

DZ

EZ

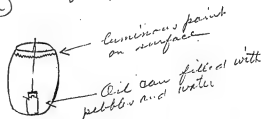
FZ

*Submarine Night
Visibility
Tests*

Feb 6/17

Got empty oil bbl placed in open where sun could shine on it practically all day. Filled it with water and put in a pail of salt to prevent freezing. Got oil can, filled it with rocks and attached a wire.

Put thin coating of luminous paint over top of water after submerging submarine (oil can)



Apparatus was not in position until 3⁴⁵ in afternoon and consequently had

only about 40 minutes of
sunlight on it and the
sun was rather weak at
that.

After dark pulled the
can up and as it was
moonlight carried it into
dark rooms.

The can should have been
luminous but was not.
I think probably because
there had not been sufficient
sun light on the barrel.

Feb 7/17

Re-immersed the can in
same stuff and pulled
up after dark with
same result.

The day had been cloudy
and some snow ^{fell} during the
morning

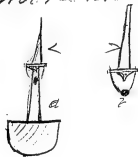
Feb 23/17

The barrel froze solidly
on Feb 8 and has remained
from ever since, in spite
of the pail of salt
put in to prevent freezing.

Feb 12/17

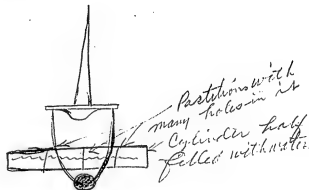
Extension Ladder to Waste Baskets

Small model constructed
under Mr. Kennedy's obser-
vation.



Result - Extension swinging
like pendulum after boat
had ceased rocking. Ext.
swung much more than
mast and. We want in
much less.

I suggested:



Stabilizer - When weight swing to left water will run, impeded more or less by partitions and counteract swing of weight. When it goes to right water will run to left and always try to keep extension on even keel.

Mr Edison says it will
work and he will try
something of the sort

Eye Tests

Feb 5/17

Under Mr Edison's orders went
to

Robt G. Reese MD
50 West 52nd St

who examined my eyes and found
Homatropin + cocaine tablets
might be put into my eyes
"with impunity"

To show me how, he put a
tablet containing 1/50 gr Homatropin
Hydrobrom 1/50 gr made by John
Wyeth + 1/300 Phila in each of
my eyes

After sitting half hour or
so things began to blur es-
pecially near at hand. In
place of one hand at the end
of an hour, I could see 3
attached to my right arm

Across the room things were not so bad but much less clear than normal. At the end of an hour he placed 4 drops 1% solution of Esine (?) which contracts pupils and was intended to offset expansion caused by homotropin.

This should have brought eyes back to normal in $1\frac{1}{2}$ to 2 hours but my pupils were very much dilated 4 hours later when we went into dark room at the lab. Mr Edison was therefore much at loss because I could not see better than those with normal eyes.

He decided the dose was too large and should be put in after pupils had been dilated naturally by being in dark room.

Feb 7

Mr Edison sent Avery and Reibert of the Storage Battery to Dr Reese to have eyes examined.

The following experiment was made with them:

10.05 Went into dark room sat in chairs 15 feet from desk on which cards with following figures in black were painted 5" high.

▲ 72 25 ● ■

10.22 Avery sees ●

10.24 Reibert " ■

10.25 " " ■

11.20 Both read all letters on optician's card used for testing eyes. Reibert reads 4th line of numbers on card and Avery 3rd line

11.50 Reibert sees ▲

12.05 One drop Homatropin
(15 miligrams Homatropin in 6 cc
water) placed in each of Avery's
eyes and one drop Cocain
(4% solution) placed in each
of Seibert's eyes, going into
dull light just sufficient to
see to put drops in while do-
ing so. All returned im-
mediately to dark room

12.40 Their vision of cards
about the same as before putting
drops in. Cards again given them
for close reading. Seibert reads
all letters, and 5th line of num-
bers. Avery reads all letters
and 2nd line of numbers. This
means 1 line improvement for
Seibert. Avery remains the same
as before drops.

12.45 to 50 stood in doorway
looking towards light then
returned to dark room

1.00 A.M. Avery (Homatropin)
reads all letters and one line
lower than before on numerals
Reibert didn't see quite so
well. He read all letters but
with more difficulty and didn't
try numerals.

1.02 Went into strong
light but were careful not
to look at bulbs. Avery
read ordinary print out
of booklet. Reibert could
not read it.

1.07 Went back into dark
room. Avery within 30 sec
read all but last line of
letters. Then handed card to
Reibert who couldn't see
any letters.

1.15 Avery sees as well as
before going into light. Reibert
sees very little.

**Notebook Series -- Notebooks by Edison and Other Experimenters
Navy and Wartime Research Experiments
Notebook, N-17-08-25.1**

This notebook was used during the periods August-September 1917 and March-April 1918 by Edison, Henry G. Wolfe, and several other experimenters for notes pertaining to Edison's work for the U.S. Navy during World War I. At the beginning of the book are entries by Wolfe and an unidentified experimenter relating to experimental work on the water kite or kite rudder at Sag Harbor, New York, and others areas along the Atlantic coast. There are also notes by Wolfe regarding tests of decoy smoke screen pots. Other entries by Wolfe describe a series of camouflage experiments using colored paint conducted during September 1917 near Gardiners Point in Long Island Sound. Also included are notes by an unidentified experimenter on torpedo detection experiments in March 1918. The remaining entries from 1918 pertain to sound detection experiments by Edison, Wolfe, and two unidentified experimenters at Key West, Florida. Some of this work was done aboard the USS *Sachem*. Included is an 11-page note by Edison from March 30, which is the only extensive Edison entry in the book. The pages are unnumbered. Approximately 90 pages have been used. Several loose pages have been inserted into the book, and at least one page has been removed.

25428
Acme Co.,
MFG. STATIONERS,
96 JOHN ST.
AND
19 PLATT ST.
NEW YORK.

Walfr

$$P = 1.51 K V^2$$

Water Kite

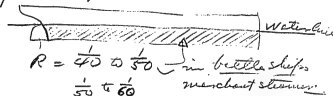
$$P = \frac{D}{g} K A V^2$$

$A = \pi$
 $V = \text{vel/sec}$

$$K = .90$$

$D = \text{density of } \overset{\text{salt}}{\text{water}} = 64 \text{ lb/ft}^3$

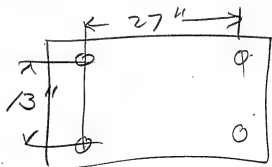
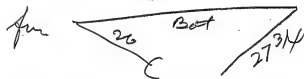
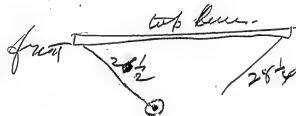
middle-line plane
fore + aft or submerged sec.



$R = \frac{40}{50} \text{ to } \frac{50}{60}$ in battleships
merchant steamers

21st din. 21 ft Cy.
2 feet. 41 ft. 12000
80 ft 40 Tonsine 10000 ft.
Range 12500 ft.
27 Kest. - Cont. 10000
30 Kest. 10000
Vas. 10000 2 Kest.
2000 Kest. 10000
2800 ft air Pres.
32 feet. 51 ft. 10000
Head - Air Pres.
din. 10000 ft.
at the base of 600 ft. Pres. 5000 ft.
5000 ft. Pres. 10000 ft.

Aug 25
Kite Rudder



dy. fada
the value

Aug 27-0



Coastline
area in
a footm

Side	Length	F
E	15	"
C	16	"
A	13	"
B	18	"
D	17	"

area of the plot

21
23
24

	I	II	III
Measure			to middle ring
A	14		18
B	20		21 1/4
C	13		17
D	13.5		21 1/4
E			22 1/2
F			15.5 - 16
			from stem

One I - Six

Base
III Cavity with 1" diameter
near for 33% diameter



acted ok, slight swelling
at upper edge, along
inside surface, clear edge,
Rem. after about 10 min. 11

weighed a little forward
did not sink. 24'

27 Aug 2001

Immersion

A
B
C
D
E

Jan 1992 last test

mult tiller
and Ely hirsuta
tiller above

admission
18
20
30

C
D

13.5
20.85

mult tiller last year. admission



line, 32

6

1

22

23

20

15

9 10

admission

7+5

X

7

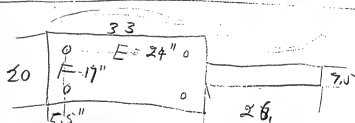
admission 11/10

Dist	a	Rt. dist	Left
10.3	22.5	15.3	
10.5	19'	15'	
10.5	22'	15.25'	
1.8		33'	

James C. C.

C
D

Dimensions.
18.5
18.25

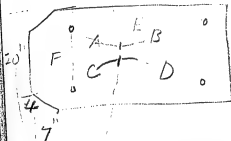


Capt Potter-Barrel Staves
Kile Red. to along
with filler & etc. } advance
33
23
16.5

with filler 21.5
35.0

Advance by 1/2 from front
low front most end corner
90°.

9" 42"



Ref.
A 22 $\frac{3}{4}$
B 29 $\frac{1}{4}$
C 27.5
D 33.5

E 26.5
F 13.5

length C = 27"
D = 28 $\frac{1}{2}$

Large Kite Buzzer

With Kite
and Tiller

Advance
12.5'

Kite Buzzer only

11'
18'
20'

Capt. Pattern Buzzer
Kite Buzzer and Tiller

22
20.5

Buzzer only
Kite

28
29

Length of line - 15 ft

Capt Patten Board Member

Immun

A-30

B-28

C-29.5

D-28

} Little Rock, Ark. & R.
Rite & J. L. 18.5
" " " 18

Some where on the Atlantic

Capt Potters

Sq rig sloops rig
- steam ship -

Capt Potters tried out scheme
of dense smoke for the morning
before wind.

Used clog of wood for
fuel - broom sticks for mast
churn cloths for sq sail -
bunk of tin can for smoke
stack - also built for ballast
+ pieces of 1x4 scrap wood
for runways -

Used oily waste for
fuel -

After three or four trial
trips - he succeeded starting
off in a perfectly successful
manner before the wind.

Trial trip made at

Gardens Bay Aug 27 - 1917

Mr Edison - approved.

Took five men in a dory to
start her on her Maiden Voyage. (2)

Kite Rudder

Tentative design for
400 ft ggt ship

Speed 10 Knts -
2.5 ft

$$\text{Area Rudder} = \frac{400 \times 2.5}{50} = 2000 \text{ sq ft}$$

~~Area~~ Kite Rudder 300 sq ft

Use 2-15 ft x 10 ft each

Side - as one 10 x 20

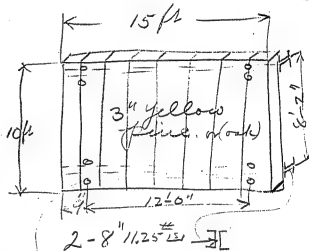
Require 2-5" dia cable

See sketch

next page

Max pres. ~~75000~~ = 75000 lb
in 10 x 15 ft Rudder

Normal pres = 50000 lb

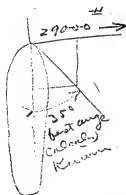


4 holes in cable 1/2"
for 1" dia steel rope
Bridle -

2-3" dia hawsen
for lead rope.

Some where on
the Atlantic Coast

~~over~~
over



$$\begin{array}{r}
 \text{Wgt of Steel } 675- \\
 \quad 1425- \\
 \hline
 2100- \\
 + 5\% \\
 \quad 105- \\
 \hline
 \text{Total } 2205-
 \end{array}$$

$$\begin{array}{r}
 \text{Buoyancy of Wood } 975 \# \\
 \text{Wgt of Steel in } H_2O \quad 580 \# \\
 \hline
 \text{Positive Buoyancy} = 395 \#
 \end{array}$$

$$\begin{array}{r}
 2.32236 \\
 97 \\
 \hline
 16329066 \\
 21001942 \\
 \hline
 226346256 \\
 183.6
 \end{array}$$

215
 10634
 02 lb / person
 147
 294
 3 lb / person
 1163

$$\begin{array}{r}
 10634 \\
 + 1163 \\
 \hline
 11634 \\
 + 7836 \\
 \hline
 15502 \\
 + 5804 \\
 \hline
 11062156
 \end{array}$$

147 lb / person
 $17850 \times 10^2 =$
 17854
 10081
 17854
 10634
 $10634 \times 87 \text{ in over 2000 sq ft}$
 10634174

$F = 2.91 \times 10^7 \text{ per } F_{\text{min}} = 2.91 \times 10^7$
 $F = \text{lb / person / min}$
 $P = \text{lb / person / min}$
 $A = \text{over 2000 sq ft}$

$$F = \frac{10634 \times 2.91 \times 10^7}{60} = \frac{10634 \times 1834 \times 60}{60}$$

$1.163 \text{ lb / min / person}$
~~1163~~

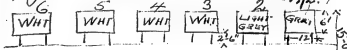
$$\begin{array}{r}
 1.163 \\
 147 \\
 \hline
 8141 \\
 4652 \\
 \hline
 1163
 \end{array}$$

33) 271.1 lb / min
~~8141~~

33) 270.961
 $\frac{271 \times 60}{33} = 492 \text{ lb / person}$

Camouflage Colored Birds
 Fort Rains off Gardeners Point
 Sep. 11, 1941.

Experiment No. 1.



Very light white, clouds along
 sky line, clear blue sky above.

Height of Eye above water line
 Sitting - 4'-8"
 Standing 9'-0"

TIME.	STAT. MILES	HEIGHT EYE	Observer REMARKS	REMARKS.
1-41-10	0.	4'-8"	EYE	STARTED (FROM SHAKES up to effect).
1-41-50	"	"	"	No 1 least visible.
1-42-00	.236'	"	"	1+2 appear to be round & smaller
1-53-25	1.59	"	"	others square & strongly visible.
1-53-25	1.59	"	GLASS	1+2 square, no 1 faintest and getting nearer to color of sky line.

TIME	miles	Height	aperture by	REMARKS.
1-56-30	2.99	4'-8"	Eye. +glasses	Strong reflection of white tower on the water - a shade reflection of No 2 - none of No 1. Can't see sand.
2-00-00	2.46	4'-8"	Eye or glasses	Object + reflection run together and makes objects 1-6 look twice as large
2-03-40	2.91	4'-8"	Eye	No 1 nearly gone.
2-04-40	3.04	4'-8"	GLASSES	Reflection + object blend together making making objects look 3 or 4 times higher 192 HULL DOWN.
2-50				
2-05-50	3.20	4'-8"	Eye	No 1 gone
2-07-00	3.34	4'-8"	glasses	No 2 gone.
2-08-00	3.47	4'-8"		No 3, 4, 5-6 come + go due to mirage effect on water - like heat waves over a hot stove.

TIME.	Dist. miles	height	observed by	REMARKS
2-09-30	3.66	4'8"	GLASS	ALL GONE.
2-10-40	3.69	10'0" <i>standing medium</i>	Eye.	Can see all - No 1 Very faintly Reflec. makes object appear 2 or 3 times higher
2-12-10	4.03	10'0	Eye.	No 1 gone.
2-14-00	4.25	10'0	Eye	No 2 gone
2-15-20	4.45	10'0	glass	No 1 flickering badly
2-16-00				
2-17-05	4.65	" "	glass	No 1 gone
2-17-30	4.70	" "	glass	" 2 gone
2-17-45	4.74	" "	"	3-4-5-6 flickering
2-18-05	4.77	" "	Eye	3-5-6 gone. <i>badly</i>
2-18-35	4.85	" "	glass	all gone.
2-19-10				turned about

Notes:
Violet cone composed
of Red-Blue + white Violet
mixed.

Common flag (Paint)
Fort Ruins of Gardener Island
Sept 12 1917

Exp- No 2.

4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE	4" RED 1" YEL 1" BLUE
-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------	-----------------------------

Water Line

Glassy Sea + bluish sky line
very thin clouds (corium clouds), some
times over sun

TIME	STAT MILES	HEIGHT	BY OBSERV	Remarks
1-0930	.4	4'-8"	Glass	Starline from ship 700 yds from ship. 1, 6, 3, 4, 5, 2. Visibility least visible given 1st in sea canal.
1-1453	1.10	4'-8"	Eye	1-4-3-6-5-2. Visibility
1-2055	1.88	4'-8"	Eye	1 4 3 6 5 2 " no 1 (can only see)
2-2245	2.12	4'-8"	Eye	1 4 3 6 5 2 Visibility thin cloud over sun
2-2620	2.6	" "	"	gravel bank and still 1/2 sky line not up to board jet.

Time	Stat miles	Height Eye	observed with	Remarks.
1-27-35	2.74	4'-8"	glass	commence to get Reflex
1-27-50	2.84	" "	glass	strong reflex from No 2+5 - none from No 1
1-29-30	2.99	" "	glass	strong reflex, can still see gravel bank <u>Sun clear</u>
1-32-00	3.39	" "	glass	Sun clear. Object & reflex run together on #1-4-5+6. No so with 2+3.
1-37-30	4.28	" "	glass	No 1, 2, 3, 6, 5, 2 visible Sun clear getting some reflection yet.
1-41-30	4.54	" "	Eye	No 1 invisible
1-42-00	4.61	" "	Eye	5+6 invisible
1-42-30	4.67	" "	"	all invis. except No 2.
1-43-00	4.73	" "	glass	Only 2+3 visible appear above skyline flashing -
1-43-30	4.80	" "	glass	all gone.
1-44-30	4.93	10'-0"	glasses	no 1, 2, 3, 6, 5+2 visible Reflex 2 1/2 times as high as wide.
1-46-45	4.94		Eye	No 1 gone

Time

1-50-20	5.68	10'-0"	Eye	Only No 2 can be surely seen.
1-51-10	5.8	10'-0"	gloss	flickering - no 1 gone
1-52-00	5.8	" "	gloss	only #2 & 3 flicker badly, no 1 & 4
1-52-40	5.94	" "	gloss	Can see only No 2 which flickers -
1-53-00	6.02	" "	gloss	All gone.

Direction taken from target
South West by West $\frac{1}{2}$ West

Camouflage
Ruins H. Gardeners Point

Sept 18-1917

Exp. J. No 3

No 1 - Krag

No 2 - 90% Black 10% white

No 3 - 80 20

No 4 - 70 30

No 5 - 60 40

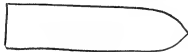
No 6 - 50 50

	Miles	Height	at ground with	Remarks
3-37.00	4	4'-8"	glow	standing at boat No 2 Boat.
5-40.00	1.19	" "	erg	No 2 Hazy
5-43-50	1.28	" "	eye	No 2 gone
5-46-25	1.62	" "	glow	No 2 gone
5-46-20	1.63	10'-0"	" "	Went on top of Cabin
5-48-10	1.85	" "	glow	No 2 gone
5-52-40	2.42	" "	eye	gravel bank plain, Vis.
5-56-30	2.92	" "	" "	do. do.
5-56-45	2.93	" "	erg	No 3 gone.
5-58-10	3.12	" "	" "	Still see gravel bank
6-00-30	3.42	" "	" "	see gravel bank
6-01-20	3.44	" "	" "	#4 gone

S.F. 192- got in range of view
Experiment done -

Clear over head - very hazy
sky line - light wind moderate sea

~~Oleum 1/4 of 2.5 lb.~~



Oleum = 2.
Wgt. per gr; 4 lb. apx.

Use 1/2 lb. T.N.T. = 7 grains -

Blood powder Exp. Charge -
Blood powder fused with fulminate cap.
to set off TNT Charge -

Oleum in ref. con.

Oleum - ignites Blood powder

" will not ignite T.N.T.

" will explode fulminate of mercury?
forming fulminic acid.

$$7512 \times 2.375^{-2}$$

$$\frac{3/4}{3/8} = 2 \frac{1}{2} \text{ diam.}$$

$$\frac{2.375}{2.57} = 0.924$$

$$191 = \frac{231 \text{ Cu in}}{4} = 58 \text{ Cu in.}$$

Inside diam shell 2.375"

" Area 4.4 sq in.

$$\frac{58}{4.4} = 13.2 \text{ say } 14 \frac{1}{2} \text{ for Blower Con.}$$

Make Con 2 $\frac{1}{16}$ o.d. $\frac{1}{16}$ clearance.

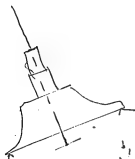
.020 thick (lin)

Inside Diam Container = 2.3125"

Area = 4.2 sq in.

$$\frac{58}{4.2} = 13 \frac{3}{4} \text{ " - allowing for fillet & shorts.}$$

Flare 22 in in 56 sec. ? Kinnim.
 $\frac{1}{2}$ inch per sec



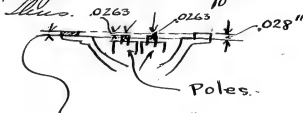
May 20th Am.

order no
5065

Started ^{to} ~~work~~ ^{inspect} Detection of

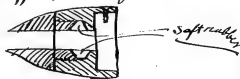
May 21-1957.

Decided to face off receiver
& replace seat cut off with rubber



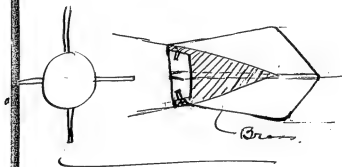
Face off 0280"-

Make stuffing box for head
of "fish"

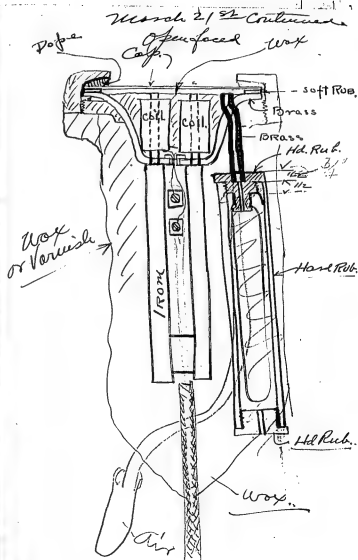


Nov 2/54 continued

Making new tail fins
of brass. (true & smooth)



Over



Mar 21. Continued.

Must get fine polish
on ^{the} surface exposed to water.

Mar 22-

May 23

According to this - Average

3 amp on teleant
Sound lost at 31 points

4 amp " 42 "

By West Mar 25-4
500 ohm resistor in fish - total resistance
wire and resistor - 666 ohms.

2.50 ohm resistor as balancers -
3 stage amplifier. Fish of malaga-gang
painted and filled - inner oil can
shells, details of construction see Mar 21-18
200 ft Cable 7 knots

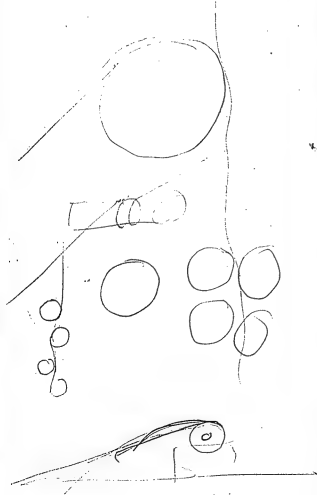
Resistance to ground 19,000,000 ohms +

5.6 ft 130 P.M.

500 ft	Amplifier	Monitor	Resistor
7 knots	4	48	48
	3	28	34
200 ft Cable	4	48	44
10 knots	3	30	34
Resistance OK.			
500 ft 10 knots	4	48	50
" "	3	34	32
Resistance OK.			
500 ft 10 knots	4	58+	56+
	3	56+	56
500 ft 10 knots	4	48	48
	3	34	30

Resistance dropped to 700,000.

Noted noise in and in step with
rev. of propeller both with cable.



Propulsion system
 Due to vibration of division?
 Taken in at 9:30
 resistance 700,000.

After 100 ft. cutting
 after 100 ft. cutting
 resistance 700,000.

~~After 100 ft. cutting~~

~~After 100 ft. cutting~~

Cable - 100 ft. long, 400,000,
 500 ft. out

Last 20 ft. of cable near fish
 = 500,000 lb.

Propulsion system electrically
 at 500 ft.

Noise - louder at 1000 ft. than
 at 500 ft.
 (500 ft. L.T.)

Key West Mar 26

500 ohm .25 sec. in fish
 total resistance 11.5 sec. 556
 2-80 ohm .1 sec. 200 sec. 2
 1-100 ohm .1 sec. 200 sec. 2

3- Stage Amplifier
 fish of Muskogean type

Resistance to ground 5,000,000 ohms

St. 245
 Briny Bille Cable -

15 ft. cable Amplifier 1 sec. 100 sec. 2
 Resistance 4

200 ft.	4	46	46
10 knots	3	30	32
Resistance	5,000,000 ohms - V		

Notes: Amplifier 1 sec. 100 sec. 2
 Resistance 5,000,000 ohms - V
 Peak Value = 2

400 ft.	4	46	46
10 knots	3	30	32
Resistance	5,000,000 ohms - V		
1000 ft.	4	42	42
	3	22	22
Res -	17,000,000		

500 ft.	amp.		
400 ft.	4	18	40
Eng. Stephens		44	50.
but under			
connection			

Resistance 1, 700, 000 ohms.

Reason noise is louder is because ear is more sensitive as tones in audion room are less

	Tail 50 ft. Reel. Co. Cable		
500 ft.	4	18	40
10 knots.	3	38	56
Resistance, 100,000 ohms.			40 V
Ac. & Value. 6.			

Eng. Stephens. 4. +5

but Rigger sit

Resistance 100,000 ohms			
500 ft.	4	46	W
10 knots	3	—	7.6
Stephens	4	44	36
under connection			—

Old rigging force.

Resistance	70,000 lb.
10 Buys	4
500 ft.	3

Hook	Anchor	Resist.
500 ft.	4	

Resistance Measurement

feet	Resistance
550	70,000
500	91,000
450	"
400	"
350	"
300	"
250	"
200	"
150	"
100	"
50	"
feet only	90,000
Resistance and	45,500
force in water	10,000,000 ft
Resistance only	
in water.	

Statement of fish

Mar 28

Key Mast	Mon 28-1918	
550 ft cable total	3 phase Andin	
500 ft Cable - 10 most		
200 lb wire rope, one fish		
Resistance to ground	5,000,000 ohms	
500 ft - 10 photos	4	56
Cable pulled by rail		
Engine stopped	4	56
Under moment arm		
Resistance to ground	5,000,000 ohms	
with Cable pulled	4	56
by Cotton rope		
same as photo	4	56
with 50 ft of cable		
lying on deck		
removed from reel		

No change in free cable from reel
up from deck.

Best stopped Andin handles cable 4
fish - 30 ft deep. Noise Value 18
Above tested conducted with every one
board quiet and all machines stopped.
With fish being pulled up and down
a few feet noise so heard as fish moves

This noise has same character
as noise heard while towing.

Ship stopped, used 4 amp
noise value of section 6
fish 20 ft. d. of

4 amp noise value = 5th
locality near Ry. West about 3 miles.

4 feet - 50 ft. 10 knots.	used, 4 amps	noise 48
10 knots 100 ft.	4	42
6 knots.	4	44

Ship stopped, used value 6.

	4 amps	26 on bottom 18 pulling up
--	--------	-------------------------------

let 4 ft. d. of on bottom.	4	56 probably moving on bottom.
-------------------------------	---	-------------------------------------

as anchor let 4 ft. d. of on bottom	4	18
---	---	----

And. value 6

Walden out in boat holding.
Cable safe from explosion

Cable Boat

Heard Steamer ~~Indisance~~
in 130 ~~yards~~ ~~distance~~ =
nearly station ~~came back~~ 2' day

4 cabs. ~~back~~ ~~away~~ 4

~~distances~~ to ~~to~~ 100 ft.

~~700 ft. of wire~~ ~~on~~ ~~Reform~~

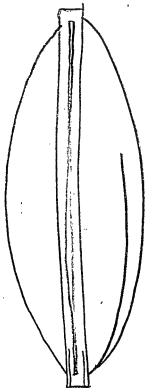
Small machinery house

Cable out at 18.

Standing Still fish on
bottom 200 ft. Cable out
and set 4 amp.
Small machinery house
+ wire out at 18.

Standing Still

400 ft. out.	Anderson	Noise Value.
10: 10:00	A	20.
Resistance to ground		3,000,000
400 ft. of cable out, with 30 ft. wire more 8	4 amp per mile 8	28
400 ft. of cable out, with 30 ft. wire more 8		
400 ft. of cable out, with 30 ft. wire more 8		
400 ft. of cable out, with 30 ft. wire more 8		



Fish lying on bottom 400' from
boat.

Anchor 4 amps noise 8
Noise 28-

Resistance to ground 5,000 ohms w
with lead weight tied to cable
10 ft from fish.

Anchor Voltage 8
Amps 4 Noise 20.

4 brass fins on brass tube placed
on cable 20' in front of fish
Anchor voltage 8
Amps 4 - Noise 26

Resistance to ground 21,000 ohms

500 ft Cable - with brass fins on
cable 20 ft ahead of fish at 10 fms
Noise = 48-

Detail of above brass fins
on opposite page.

Plugged hole 4/4
over

Plugged hole in wire 44

500 ft. 4 amps.

Noticed snap every 10 or 12 seconds, preceded by a buzz & followed by a musical note.

250 ft. 4 amps 40

Snap every 20 seconds -
preceded by buzz — 3
musical notes gone.

100 ft. out. brass squid
Don't sink.

350 ft. out. Resistance 90,000 ohms

200 ft.

4 amps

48 ✓

10 knot.
Resistance 30,000 ohms.

500 ft. — 4 amp. — 52 ✓

Resistance 70,000 ohms.

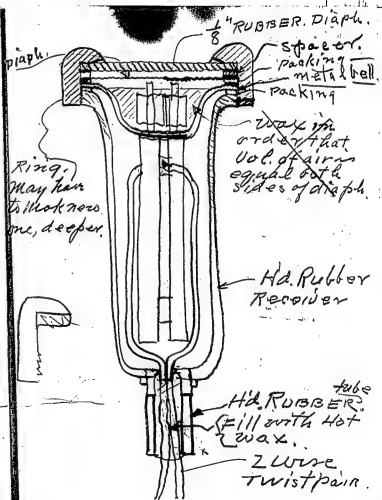
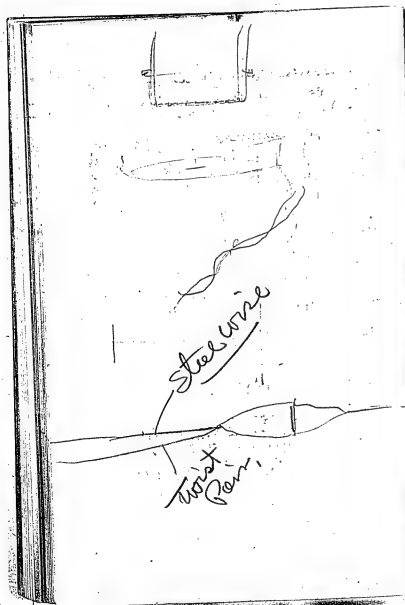
5 knot

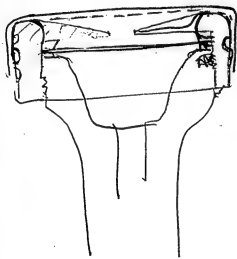
4 —

56+ ✓

500 ft.
Resistance 60,000

Mar 28





March 10

Have found that most of the noise on towing line is due to mechanical waves on the towing line - These waves are transmitted along the tow line by vibration of water friction & the boat. Partake of the waves, the diagram picks them up & with her them 35 to 50 on cushion box at 500 ft. They are slightly less at 1000 ft. If boat has engine & anchor about 100 ft suddenly it does not diminish showing its ~~not~~ not boat sound but mechanical waves thrown on the tow line.

Today & laid out 100 ft of tow line on dock by placing

Cables in teeth & dragging
the 100 ft. of cable over the
boards of the deck the
noise was fearful, continuous
except where rough splint on
deck, this gave a snap

In fact it acts just like a
phone stylus worked on
friction principle - Even
rough splint on deck &
cables throw waves into
the wire -

Teeth-to-cable impact ear

ding

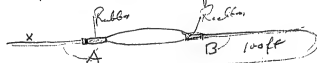
100 ft

If I interpose a piece of
Rubber to take strain

Rubber

Q

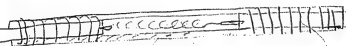
then no sound is heard in teeth
Wolfs repped up a fish line



by pulling at X - the boat & 100
ft cable dragged but no
sound transmitted to teeth
at X yet at B the sound
was terrible -

This Rubber meant kills
the mechanical
waves -

In practice we can
insert 2 or more of
these rubber deaden
in tow, line



Rubber - small
spiraled connection wire -
joints well fused no no
water gets in -

Entire strain is taken by
Rubber tubes & vibrations
stopped. Rubber tubing
should be 8 @ 10 inches
long & stands 60 lbs
without breaking or collapsing

one of these inserts can
be put 100 ft from
fish & one within
1 ft of fish, or right
on fish -

Another Experiment
we tried was to drag
100 ft Cable over dock
to see if it electrified
and use Audion
3 stage -

Then got 12 on the
box - Audion 2

This was with Cable
smooth rubber

When we substituted the
twisted 2 wire
Cable the noise went
to 45 on box at the
twist just great knock -
Therefore the Cable is
Electrified by rubbing
on boards -

But previous tests
show on 8 on box - (1/2)
with 1000 ft at
10 knots in water
without fish or phone

showing that we do
not need fear electrification
here -

We are trying paralytic
currents now -

If two wires connected
to primary of anchor
+ wires lowered over
boat into water
get no sound in anchor
still or moving
both wires coiled
also brass plate
q was 14 on box

If a large plate is
connected (iron galvanized)
is used with 1 wire
+ bare wire on other
no sound in audion

If Brass plate is
used just hear 3 @ 4
faint on audion -

With Iron galvanized
connected to 1 wire
and the boat to
the other wire,
got 14 on audion

this looks as if we had
at boat a clean
Copper plate + diths
on fish, we can
use the Earth return
+ a single conductor
Cable -
this would simplify
Matters.

Two Copper wires each
3 ft long bare put in
sea - no noise on
audion, moving
+ still -

100 ft in front of fish-locks

Rubber



Anchor Stone value

500 ft
(depth)

3.8 42

Distance to ground 400,000 ft

500 ft cable, out
500 ft cable pulled from 30' down
from stone

Anchor	Stone
3.8 amps	46 ✓
3.8	52

Distance 10,000,000 fms. ✓

100 ft Cable coming from 30' from
forward, fish rods, stone
Rope, cable, etc.
Rubber tube, connected between
cable and stone
Clean, only in 30' down

100 ft 7 fms. 3.8 42

Distance 10,000,000 fms.
500 ft of cable, out from 30' down
500 ft cable, out from 30' down

500 ft 10 fms.	3.9 amps	35 40
Clearing up mud, fish none of seaw.		

With hot water, prominent
and engine, out from stone 3.9

Same Place as shown in
March 21 - exact 20 in rubber
exp joint is attached to hose of
fish, + fish is air filled
instead of water filled
wire

Same phone as
 One Cable tone
 Disconnected.
 10 k.c. 2. 3,8 amps. 50,
 500. ft.

12.5 ft. wire 50
 (not 12.5 ft. pitch noise on water
 in 12.5 ft. the phone, & found it
 Not as far as expected.

Phone in at 100 ft. +
 5-15 ft. -

April 1, 1918

With telephone in fish with air inside
 further in water and must tell as
 sound of coral

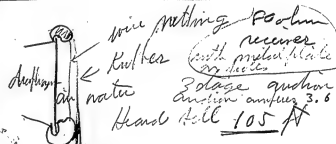
Heard bell 115 ft
 Audion amp 3.6
 Used same phone as in Mar 31 Exp 1

Put telephone in water without fish
 Audion amp 3.8 195 ft
 Heard bell
 Water shallow in which bell was used

Distance between docks

20 ft. = 125'

7' In deep water
 Telephone out of fish
 Audion 3.8 amps distance 375'



This telephone is extremely
 sensitive in air
 Water on one side air between
 with and deepening - Bell 105'

Removed water deepening
 Hand bell 251 ft
 Audion 3.6 amps

April 2-1918
 50 lbm. pump in water
 with rubber diaphragm over
 a $\frac{1}{32}$ " brass plate containing
 $\frac{1}{4}$ " holes in between rubber
 and diaphragm Heard bell
375' - Andion ampers 3.9

Removed rubber diaphragm and
 brass plate -
 Heard bell 425' Andion ampers 3.8

Installed rubber diaphragm
 backed by $\frac{1}{32}$ " brass plate with
 $\frac{1}{8}$ " holes Heard bell 375'
 Andion ampers 3.9

Apr 6th Res = 47500.

500 lbm. Rec. Brown Ave.

3.5 surface Andion.

Heard bell, ~~375'~~ 385'

Notes against diaphragm 385'

$\frac{1}{4}$ " hole in diaphragm $\frac{1}{16}$ " dia. 335' 320'

$\frac{1}{8}$ " " " $\frac{1}{32}$ " dia. 333' 325'

$\frac{1}{8}$ " " " $\frac{1}{16}$ " dia. 335' 330'

$\frac{1}{8}$ " " " $\frac{1}{32}$ " dia.

$\frac{1}{16}$ " " " $\frac{1}{16}$ " dia. 305' 300'

tide running away from receiver
 toward source of noise

Rub. diaphragm 385' - no surface. 254'

Still test off dock.

April 14th.

500 lb. return - 600 lb. in
in Brass shell, airtight, with
washers.



Long rubber tube
air & water.

Run on auction 3.5

South bell out in boat

Peak bell.

Water against diaph. 1225 ft.
Rub. sheet on $\frac{1}{4}$ " holes - 1215 ft.
" " " $\frac{1}{16}$ " holes 1100 ft.

The rubber sheet was forced
up by a brass plate $\frac{1}{8}$ " above
of the regular diaph.
the first one consisted of $\frac{1}{4}$ " holes
drilled $\frac{1}{2}$ " apart + then 2nd $\frac{1}{16}$ " holes
 $\frac{1}{2}$ " apart - + then sheet rubber
stretched over these discs
There was little dif. between

21013

the water against diaphragm
+ when disc with $\frac{1}{4}$ " holes
was used - but quite a fall
off when the $\frac{1}{16}$ " holes were used

W. J. F.

Steel test off dock.

April 9 -

Took same phone in metal
case, described Apr 8. +
compared it with new one
described by drawing, "A"
+ which I used case neophone
in that experiment -

We placed both phones on tray
off dock + as weather was
too rough to go out in boat
we ran cable on opposite side
of dock at a constant distance
+ added resistance to line until
ring of ~~bell~~ was just out.

as
Camp on Audion 4.-

Neophone - noise written out at 50
old phone " " " + 48

new phone ^{500 ft} had resistance of 173 ohms
old phone had resistance of 516 ohms

over

There was very little difference in the audibility of the two phones - except the old one seemed to be a more natural tone,-

In touching the supporting strings of each cable the new one was very noisy while the old one was quiet,-

wave.

Key Went April 10 - 1918

On dock -

Nonfunctional to antenna
Primary of antenna connected to case
None valve in circuit
firing occasionally 2

A No ground on case
Same with primary not connected to case

75' army field cat to land on dock and connected to support.

B. None like communication
None valve 10
Primary not grounded to case

75' army cable stretches 7' high along dock - None 15

Primary not grounded to case

C Case not grounded
Case grounded - None 36
Primary middle point connected to case
None valve 2
Case grounded - Primary middle connected to case 2

95' Cable - $\begin{matrix} 75' \\ 40' \end{matrix}$

{ End 40' length - Value 8
 Primary not grounded Case not grounded
 " " " Case same - 10

- End 10' length Value 4
 Primary not grounded Case not grounded
 Case grounded 10

Note: noise heard was very much like commutator noise traced thru to telephone cable along deck. In those cases where noise was louder cable was near and parallel to telephone cable. When run right along side maximum noise was obtained.

Key West April 15, 1918

A - 500 ohm phone in brass container -
 water against diaphragm

B - 500 ohm phone in fish with $\frac{1}{32}$ " hole in
 brass plate covered with $\frac{1}{32}$ " rubber

Relative Values			
A	34	32	44
B	30	26	40

Key West Apr. 15, 1918

300 500 ohm phones mounted in brass containers with water against diaphragms.

I - air compensation for pressure.
 by means of water tubing

II - diaphragm not compensated
 telephone in copper tube in fish
 subjected to noise of submarine
 charging. Used standard cable
 box to get values of noise
 depth submerged

	I	II
Noise value		
2 ft	42	48
10 ft	56+	36

April 16-1918

1.5 ft	Installed	38	40
5 ft	air tube	44	44
10 ft	compensated	52	42
	on #II		

with copper tube removed
 value = 56+ \pm II phone
 set on

Key West April 17-1918

Installed rubber washers on
diaphragm on #II phone
First phones in water #II phone
not in first. Used bell as source of sound.
Ref. to Morse

	I	II
5 ft	5.0	5.0
10 ft	5.2	5.2

with #II phone in
Copper tube of fish *

46 46

* Audion amp. dropped 3.8 to 2.5

Key West April 19-1918

Phone I - 500 w receiver in brass
container water against diaphragm.

" II - 1000 w liquid receiver in
fish - diaphragm separated to form
left line of fish - receiver ~~in~~
in air chamber produced by cylindrical
brass piece with 1/8 holes covered by
rubber

III 500 w receiver in coffee tube
fish water against diaphragm
lifter tube - producing
separating phone cone and coffee tube

IV 500 ohm receiver in air chamber
produced by rubber sheet ^{acoustic} ~~plastic~~ ^{plate}
thin plate containing holes. 1/8"

Resistance to ground
Resistance to ground #II = 1,000,000 w
5 ft. of cable in water

#I = 120,000
#III = 17,500
#IV = 500,000

Rel in boat out about
300 ft, used standard cable box
to compare values.

Number I phone

" II "

" III "

" IV "

None of bell

42

4

4 3

4 3

found lead on #2 open
Repeated test boat about 300 feet
away

Number I phone

II "

III "

IV "

None Value

44

40

40

44

May West (21-22)

On loose wire

500 ft of cable - 500 ohm head

resistance in fish II None 20

7 hrs. Andromeda 4 50+

Resistance logarithmic

Andromeda 500 ohm phone # III

500 ft cable 500 ohm phone # III

7 plants None 34

10 plants " 34

Resistance, 10,000 ohms, +

Note the heavy on the fish

solid. Very poor condition of

wire.

500 ft cable 500 ohm phone # IV

7 plants None 50+ M.K.

7 plants (Mr. Edison " 10

Resistance to ground 50,000 ohms.

250 ft cable None IV

7 plants None 50+ M.K.

Mr. Edison " 12

1000 ft cable phone IV

plants held cable close to boat

None - load broken head in
thru - None correct, checked
distance of cut 94,000 ft.
Worked cut 6 in and found 1/2 in
rubber line head parted

III - Not hollow tail on,
11-12 ft.

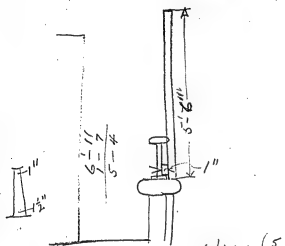
250 ft. from load, legs dis-
at, egg-like material about 110 ft.
minute

at 50 ft. head, some breaks
less pronounced.

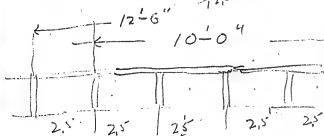
III Run 500 ohms - 1 with hollow tail
Pulled from 100 ft. near top
75 ft. of cable
None

24

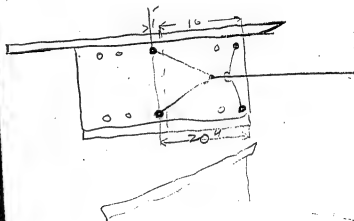
Run 1000 to ground 20,000 ohms
Disassembled telephone and found same
insulation due to disconnection not being
properly centered?



25' / 12.0 (5)
12.5



10 1/2



32

 $\times 7/4$

$$\begin{array}{r} 19.5 \\ 32 \\ \hline 39.0 \\ 58.5 \\ \hline 624.0 \\ 15.2 \\ \hline 776. \\ 87.5 \end{array}$$

$$\begin{array}{r} 19 \\ 12 \\ \hline 38 \\ 2 \\ \hline 152 \end{array}$$

$$\begin{array}{r} 120 \\ 12.5 \\ \hline 87.5 \end{array}$$

$$\begin{array}{r} 3880 \\ 5432 \\ \hline 6208 \\ 679-20.0 \end{array} \quad \begin{array}{l} 17.25 \\ 680.00 \text{ in } (140) \\ 680.00 \end{array}$$

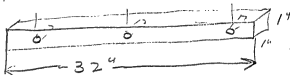
4 cu ft wood

$$\begin{array}{r} 62.5 \\ 64 \\ \hline 40. \text{ spg white pine} \\ 24. \\ 4 \end{array}$$

$$\begin{array}{r} 9.6 \\ 10 \# \end{array}$$

$$\begin{array}{r} .254 \\ 7/60 \\ \hline 8.75 \# (30 \text{ cu in}) \end{array}$$

(1" \square \times 30" lg.)



$$\begin{array}{r} 7.25 \\ 57.3 \overline{) 60} \times 5.75 \\ \underline{46} \end{array}$$

$$\begin{array}{r} 46 \overline{) 57.3 \mid 125} \\ \underline{46} \\ 113 \\ \underline{92} \\ 210 \end{array}$$

$$\begin{array}{r} 5.75 \\ 75 \\ \hline 2875 \\ 4025 \\ \hline 43025 \\ 425 \end{array}$$

$$\begin{array}{l} 52 \quad 30'' - 30'' = 52 \\ 10 \quad 8' - 80 \end{array}$$

$$\begin{array}{r} 52 \\ \hline 57.3 \times 60. \end{array} =$$

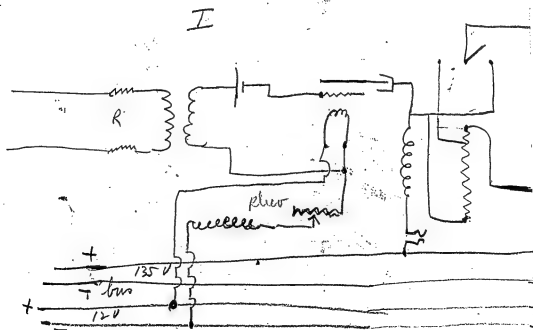
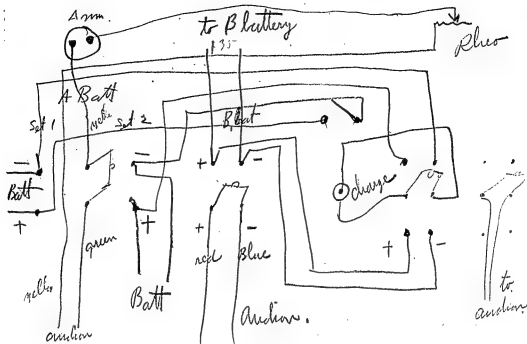
$$\begin{array}{r} 1.1 \\ \hline 57.3 \times 60 \\ \hline 5.2 \end{array} \times 5.75$$

$$\begin{array}{r} 66 \\ 3450 \\ 3450 \\ \hline 379.50 \\ \hline 294 \\ \hline 85 \end{array}$$

$$\begin{array}{r} 57.3 \times 60 \quad \times 5.75 \\ \hline 6730 \end{array}$$

$$\begin{array}{r} 52 \\ 67 \overline{) 379} \mid 566 \\ \underline{335} \quad 52 \\ 440 \quad 1133 \\ \underline{402} \quad 130 \\ 380 \quad 294 \end{array}$$

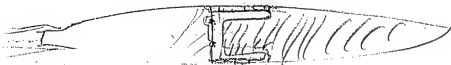
[ITEM(S) FOUND IN BOOK]



[ITEM(S) FOUND IN BOOK]

Key West
April 1-1918

[ITEM(S) FOUND IN BOOK]



Notebook Series -- Notebooks by Edison and Other Experimenters
Navy and Wartime Research Experiments
Notebook, N-18-02-21

This notebook was used in February-March 1918 by William A. Hayes and William Deans for notes pertaining to Edison's work for the U.S. Navy during World War I. There are numerous notations by Edison, many of which are pasted into the book. The entries by Hayes at the beginning of the book describe a series of forty test recordings made at Key West, Florida, on a submarine, a sub chaser, and a sea plane. The recordings were intended to test the performance of submarine detection receivers. The entries in the second part of the book are primarily by Deans, although there are a few by Hayes and most are signed in the name of both experimenters. They describe sound detection experiments based on new instructions from Edison, and some include rough drawings by Edison. The inside front flyleaf is inscribed "Records made for Mr. Edison at Key West" and "W. A. Hayes." The book contains approximately 40 unnumbered pages followed by 52 numbered pages, some of which are blank. Several loose pages of drawings and mathematical equations have been inserted into the book.

Records made for
Mr Edison at Key West.

W. A. Hayes

95428

Stone Co.,

ENG. STATIONERS,
95 JOHN ST.
AND
19 PLATT ST.
NEW YORK

Feb 21 1918

Record #1

Made on Sub-Marine K. 3.

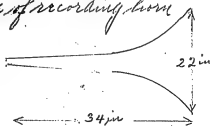
Speed of recording machine 75

Boat running on surface

Engines running full speed (325
turns per minute)

Record made about 11 ft from
engines.

Size of recording horn



Feb. 21. 1908

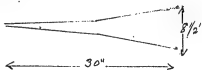
Record # 2
made on sub marine R. 3

Speed of recording machine 75

Boat running on surface

Engines running full speed (325
turns per minute)

Record made about 10 feet from
engines with smaller tube
than one used on #1 record



Feb 21st 1918

Record #3

Made on Submarine N. 3
Adjusting Pump along
field of recording machine 75

Boat running on surface
and submerged.

First half on surface
Second " submerged, about
18 feet

Record made with horn 34"
long and bell 22" diameter

Record taken at 6 feet
from pump.

About 450 sec
fairly strong

Feb 21 1918

Record # 4 Submarine K.3

Steering and diving
rudder contactors

Speed of recording machine 75

Speed of boat 6 knots

Arm wire 34" long 22" diameter

Last half of record cut very
light

Record made at a distance of
about 3 feet

1500 sec
Very faint

Feb 21 1918

Record #5 Submarine K. 3
Went 6 knots
Main motor and vacuum
pump gearing
Taken about 8 feet from
motor and 14 feet from
gearing

Speed of recording machine 75

Last part of record cut very
light

Horn used 34" long 22" diam

432
~~750. Very faint~~

Feb 21st 1918

Record #6 Lark Marine N. 3

Main power pumps

First half of record 1 pump running

Second half of record 2 pumps running

taken about 5 feet from pumps

Speed of recording machine 75

Horn used 34" long 22" diameter

2 mi. / 2 pumps
more distant 600 sec -
Stronger trace than
next, see distance
clear cut

Feb 21 1918

Record #7 Sub machine K.3

Engines running full speed on
top

Record taken about 30 feet from
engines

First part of record cut very light
Second half cut deeper

Speed of recording machine 75
Worm used 3/4" long 22" diameter

about 1800 to 2000 Sec
Counting all vibrations
350 @ 400 Sec
Some larger vibrations

Feb 21st 1918

Record #8 Lull Machine N. 3

Engines running while changing
the tape

Record taken about 30 feet from
engines

First part of record cut light

Second part cut lighter

Speed of machine 75

Horn used 34" long 22" diameter

Feb 21st 1918

Record #9 Sub-marine K. 3

Engines running while charging
3 different depths of cut

1st deep

2nd fairly deep

3rd lighter

Speed of molding machine 75

taken about 30 feet from engines

Horn used 34" long 22" diameter

Very big waves!

Feb 23rd 1918

K. 3 Sub Machine

Record # 10

Main Motors running with all auxiliaries
out but murgell arrest 23' grad
Speed of track about 7 knots
Speed of recording machine 75
Taken about 3 feet from motors
not large horn
Recording needle 4/1000
but a little too deep

375 per second

Next try again greater distance from
also try with 5/1000 needle

Brnd #11

Feb 25. 1915

Sub marine K. 3

Brnd of Bell used while boat
is submerged

Distance away about 30 feet
taken while submerged 25 feet

Speed of boat about 6 knots

Speed of machine 70'

Large horn used in recording

40/1000 needle used in recording.

12
General assortment
of waves &
maximum about
8 waves to one
Area of micro
Strong - less
Strong than
Dried on Sub

2-26-18

Record # 12 Sub. Char. # 152
Taken about 12 feet from engine

Large horn used.

Reverding machine speed 75

Speed of Boat 15 knots

3 Engines running full speed

40,000 needle used

100 threads to inch

(Mr. E. remarks on opposite page)

General assortment of waves
maximum about 8 waves to 1

area of microscope

Strong but not so strong as
Diesel engine on Sub marine

13
Not much
difference in
volume between
this 12 ft +
30 ft

2-26-15

Record #13 Sub. Cliner # 152
taken about 12 feet from engine

Large horn used
Recording machine speed 75
Speed of Boat 15 knots
2 engines running full speed
40/100 needle used
100 threads to inch

Opposite page 111 to Large
Not much difference in volume
between this 12 feet away
and 30 feet away

14

Very much
weaker,

Think the strength
increases faster
than directly
as to the number
of Engines

2-26-18

Record #14 Sub-chaser #152

taken about 12 feet from Engines

Large horn used

Recording machine speed 75-

Speed of boat 15 knots

1 engine running full speed

#91000 needle used

100 threads to inch

Opposite page. MW Co. says

Very much weaker.

Think strength increased
faster than directly as to
the number of Engines

15

Stronger a little
more than

1. Engine running
about 6 waves
to one area of
micro -

2-26-18

Record #15 Sub. chase #152

taken about 12 feet from engine

Large horn used
Recording machine speed 75-
Boat standing still

Auxiliary engine and compressor
running

40000 needles used
100 strands to inch

On opposite page Mr E. says

Stronger a little more than
1 engine running, about
6 waves to one area of
microscope

16

About $2\frac{1}{3}$
or strength of
15-

about $4\frac{1}{2}$ @
5 waves
in area

2-26-18

Record #16

Sub. cover #152

Taken about 12 feet away from the gun

Large horn used

Recording machine speed 75

Boat standing still

(Compass) does not
work

Auxiliary engine, running slow

25/1000 needle used
100 threads to inch

Mrs. E. says on opposite page

About $\frac{2}{3}$ or strength of #15

About $4\frac{1}{2}$ to 5 waves in
area of microscope

17

Not quite so
strong as full
speed.
Seems to have
about same wave
in area which
is strange —

2-26-18

Record # 17 Sub. chart #

Record taken about 12 feet from engine

Large horn used
Refracting machine speed 15
Boat running about 5 knots
3 engines running $\frac{1}{2}$ speed

40/1000 needle used
100 threads to inch

Mr. E. says on opposite page

Not quite so strong as full
speed

Seems to have about same
wave in area, which is
strange

18

About same
strength as
full speed &
as many feet
more waves
per area than
full speed

2-26-18

Record # 18

Sub-class # 132

Record taken about 12 feet from the
engines

Large horn used

Speed of recording machine 75

Speed of boat about 8 knots

2 engines running half speed

#9/100 needle used

100 threads to inch

Mr. E. says on opposite page

About same strength as full
speed and as many if not
more waves per area than
full speed.

19-

Seems stronger
than when full
speed +
more waves
per area -

2-26-18

Record #19 Sub-classer #152

Record taken about 12 feet from engine

Large horn used
Speed of recording machine 75
Engine running $\frac{1}{2}$ speed

#4/100 needle used
100 threads to inch

Mr E. says on opposite page

Seems stronger than when full
and more waves per area

20 -

Seems to be
about $\frac{3}{4}$ of
strength of
same test at
12 ft

2-26-15

Record #20

Sub. Glass #152

Record made about 27 feet from engine

Large horn used

Speed of recording machine 75

Speed of boat about 15 knots

3 Engines running full speed

10,000 needle used
100 threads to the inch

Mr. E. says on opposite page

Seems to be about $\frac{3}{4}$ of
strength of same test at
12 feet

21

Considerable
weaker than
at 12 ft

2-26-18

Record #21

Sub, class W #152

Record made about 27 feet from engine

Large horn used

Speed of recording machine 75

2 engines running full speed

40000 needle used

100 threads to the inch

W. E. says on opposite page

considerable weaker than
at 12 feet

22

A little ^{less} than at 12 ft

2-26-18

Record # 22

Sub. chain # 152

Record made, about 27 feet from engine

Large horn used

Speed of recording machine 75

1 engine running full speed

44/1000 needle used

100 threads to inch

Mr E says on opposite page

is little more than at 12 feet

23

$\frac{3}{4}$ strength
of full speed

2-26-18

Record # 23

Sub-chaser # 152

Record made about 27 feet from engine

Large horn used

Speed of recording machine 75

Speed of boat about 17 to 5
knots

3 engines running half speed

40/1000 needle used

100 threads to the inch

Mr. E. says in opposite page

$\frac{3}{4}$ strength of full speed

2-26-18

Record #24 Sub. closed #152

Record made about 27 feet from engines

Large horn used

Speed of recording machine 75

2 Engines running half speed

40/100 needle used

100 threads to the inch

2-26-18

Record # 25 Sub-chaser # 152

Record made about 27 feet from engines

Large horn used

Speed of recording machine 75

1 Engine running half speed

4000 needle used

100 strokes to the inch

2-26-18

Record 26 Sub class #752

Record made about 27 feet from engine

Large horn used
Speed of recording machine 75

Auxiliary engine running alone
Boat standing still

40/1000 needle used
110 threads to the inch

2-26-18

Record #27 Sub chaser #152

Record taken about 27 ft from engine

Large horn used
Speed of recording machine 75

auxiliary engine and compressor
running

Boat standing still

40/1000 needle used
100 threads to the inch

28

Scarcely can
see it

2-26-18

Record 28 Sub-chaser #152

Record made in Bow of Boat
about 35 feet from engines
and behind Pilot rigger

Speed of Recording machine 75'

3 Engines running full speed

Boat speed about 15 knots

14/100 needle used
100 threads to the inch

M. E. Saylor opposite page
Scarcely can see it

2-26-18

Record #29

Sub. 6 laser #152

Read made in Bow of boat about
35 feet from engines and back of
Pilot room

Speed of recording machine 75

3 Engines running full speed

Speed of boat about 15 knots

3/1000 needle used
200 ahead to inch.

DEPARTMENT OF COMMERCE

30

Main Vibration

1 to 8 tenths area

Many Vibrations

Something like

Submarine running
full speed on

Diesel

about 18 lbs
per acre
all over

No. 283
S. G. 6-12-11-1,000,000

2-27-18

Reid #90

Sea Plane #435

Reid. taken in open air about
40 feet from machines

Large loud sound

Speed of revolving machine 75
4/1000 revs. per sec.
100. turns to the inch

Planes standing still engines
running full speed

Mr E. says on opposite page.

Main vibrations 1 to 8 tenths area
many vibrations something like
submarine running full speed
on Diesel; about 15 vibrations
altogether.

DEPARTMENT OF COMMERCE

31

Very much

weaker

3 times or more

No. 283
U.S. G.P.O. : 1900

2-27-18

Record #31

Sea Plane #33

Record taken about 40 feet from machine

Large horn used

Speed of recording machine 15

40,000 needles used

100 threads to the inch

Plane standing still

Engines running half speed.

on E. eng. on opposite page

Very much weaker

3 times or more weaker.

DEPARTMENT OF COMMERCE

32

Where used
justed. Very strong
10 a.m. 25

all together in
arch - big - little
at start

Dies away very
rapidly - nothing

No. 211
24.5-25.5-100.00

2-27-18

Record # 32

Sea plane #435

Start of record made about 40 feet
from machine

Large horn used

Speed of recording machine 15

4,000 miles used

100 strands to the end

Plane starting and going out
gradually.

See & says on opposite page

When wind got very strong
ward 25° altogether in time
big and little at start

Dies away very rapidly - got
nothing.

DEPARTMENT OF COMMERCE

33

Just see it when
150 ft or over

Little reaction
Extremely faint

No. 333
D.L. 6-27-11-1,000,000

(33)

Mr. E. says above
Just see it when 150 feet
overhead

Little reaction
Extremely faint

2-27-18

Record # 33

Sea Plane # 435

1st Part of record.
Plane coming in and stopping
about 40 feet away.
When I started to record I should
judge the plane to be 150 feet
away.

Wind was blowing in my face.

2nd part

Plane passing over head about
150 feet in air
Passed very rapidly

3rd part

Plane landing and coming
to stop.
Plane about 45 feet away
when stopped
Plane about 100 to 125 feet
away when I first started to
record and on the water.

3-4-18

Record # 32

See Plate 32

Start of record made about 120 feet from Plate and I continued to follow Plate trying to record until it had reached a distance of about 300 feet.

Large horn used
Speed of recording machine
75 r.p.m.
10/000 needle used
100 threads to the inch

Plate starting and going away

3-4-15

Record #35

Sea time 500.

Start of record made about 50 ft
from plane and I continued
to follow plane trying to get
rec'd until plane arose from
the water, about 300 feet away

Large horn used
Speed of recording machine 75
44/1000 needle used
100 threads to the inch

Plane starting and going away.

36 —

~~Dec 1880~~

Its faint but
quite distinct
Could hear this
I think at 1000
yds of noise
only little,

3-6-18

Record # 36 Sub Marine K. 3

Motor operating diving rudder

Record taken about 12 feet from
motor

1st trial cut very light

2nd trial cut deep.

These noise occurs intermittently
operated by wheel.

Large horn used
Speed of recording machine 75
No. 000 needle used
100 threads to inch

Motor 1 Horse Power 450 R.P.M.

37

Very much
2 Changer -

3-6-18

Record #37

Submarine N. 3

Motor operating diving machine

Record taken about 5 feet from the
motor

1st trial - cut light

2nd " " lighter still

3rd " " deeper

These noises occur intermittently
operated by air hose

Large hose used

Speed of recording machine 75-

40/1000 needle based

100 threads to the inch

Motor 1 horse power 450 T.P.M.

38-

Quite strong
stronger than

37 - don't
think be any
trouble 1000
yds on this

3-6-18

Record #38 Sub marine K3

Motor operating steering and clutches 2 H.P. 450 RPM

Record taken about 12 feet from
motor

1st trial, cut light
2nd " " deeper

These noises also occur, intermittently
operated by critical

Large line used
Speed of reeling machine 75-
45000 yards per hour
100 threads to the inch

39 -

faint but
read -

3-6-18

Record #39

Sub-marine K.3

This record has both the driving and
storing motor noises on it
taken in Forward Battery department
about 25 feet away.

1st Part driving motor (25 ft away)

1st trial cut drop

2nd " " lighter

— " — " 1 H.P. 450 R.P.M.

2 Part Storing Motor (25 ft away)

1st trial cut lighter

2nd " " little deeper

3rd " " still deeper

Notes - records in unit 4. 11. 11

Large horn used

Speed of machine 75

40/1000 needle used

150 threads to inch

2 H.P. 450 R.P.M.

40

longer
than Diving
Bubbles He after
should hear
this way at
1000 yds if
I can hear

3-6-15

Record # 40

Submarine K. 3

Motor Generator for the scope lamp

Speed 2250

Lamp Voltage regulator for above

Read sound about 1.5 ft away

Second pair of ears trial to the
voltage regulator which to the
earrings about the sound

3 cuts. Taper

1st deep

2nd light

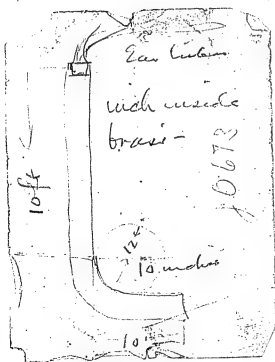
3rd deeper than 2nd cut

Large dark area

Speed of recording machine 20

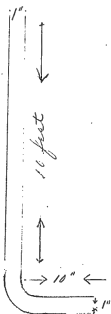
10000 Hz scale used

100 strands to the inch



March 7th 1918 ①

At Mrs E. instructions had a brass tube following. Dimensions made



Bend to radius 12"

March 8th 1918

Trid. tube submerged in water
4 parts in water and 1 part
with air.

Heard boats passing about 300 feet
away but sound was very weak
and somewhat metallic.

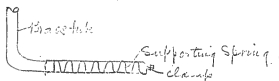
Trid. tube at different depths and
found that when I pulled nearer
the surface sound became weaker.

March 9th

Went out to long dock near forts
and tested with Moore's Bell. With
I could only get about 150 feet
away, I then put a rubber
diaphragm over mouth of tube
submerged and found sound
much better. In fact could
get bell about 250 feet away.
I also could get boats of
all sizes 250 yards or 750 to
800 feet away.

March 11th

Had devices made up to attach to lower
end of tube as follows. Each consisted
of a rubber tubing supported on a
brass spring, and closed at the outer
end.



These Rubber ends were of following dimensions

#1	12" long	- circular cross-section
#2	9" "	" "
#3	6" "	" "
#4	3" "	" "
#5	6" "	- elliptical "
#6	12" "	- square "

Results,

March 14th

With 12" circular can hear Moore's Bell
at distance of about 425 feet.

Same for 9" circular

for 6" circular from 400 to 425 feet.

4

With 3" circular - same (700 to 425 ft)

The results with the elliptical and square cross section tubes were the same as above.

In fact, the shape of the tube seems to make no difference.

The sound heard seems louder when the end of the tube is pointing toward the source.

In order for this scheme to work, all water must be kept out of the tube. As soon as water enters the tube, the usefulness is destroyed - the device seems to go dead.

Must come up with some new device for supporting rubber tubes. Schemes -

- (1) Ball tube full of holes
- (2) Support rubber on rods run longitudinally.

Partly

Huges & Evans

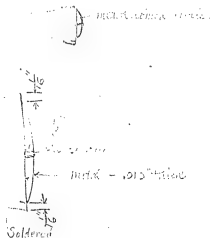
5

12/1/15
The experiment was run on 12/1/15. The results were as follows:

Attach horn - 2 1/2" opening about 1/2" at the end of listening tube.

1st - 2500 cycles per second was heard - got 1000 cycles.

2nd - the electric source for the source.



Try few distances of hearing bell ~~in air~~ taking into account direction of the wind.

Daily - Day 18 June.

March 16th

Tried horn fitted with rubber diaphragm over mouth, as under "1st" on preceding page.

Results - greatest distance at which Morse's bell could be heard = 425 feet.

Then tried same outfit except that on diaphragm we had mounted the metal dome device as under "2nd" on preceding page.

Results for distance same as before (425 feet).

With this device, the tone heard was more metallic than with the plain diaphragm. The real sound of the bell could be heard with greater sharpness than when this additional device was not used.

Just as we had completed the tests and Mr. Hayes was listening to a boat in the channel the diaphragm broke.

Tests in air for effect of wind.

Method of tests Pointing the horn with the mouth toward the bell, we gradually moved the bell away from the horn until the sound from the bell could no longer be heard. The directions in which the bell was moved were as follows.

1 - into the wind, that is so that the wind blew from the source of sound to the horn

2 - in the direction of the wind, — so that the sound travelled from source to sound against the wind.

3 - at right angles to direction of wind to left of observer.

4 - at right angles to direction of wind to right of observer.

Results

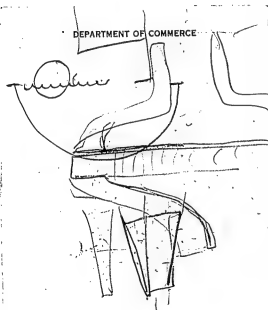
For 1 (sound travelling with the wind) the sound of the bell was lost at a distance of 88 feet.
 2 (sound against the wind) sound lost at distance of 75 feet.

3 and 4 Results the same — distance 80 feet.

Additional tests.

We listened to the bell, to the exhaust of the engines in the Electric Power House on the main land, and to the noise of an aeroplane. We pointed the mouth of the horn, ⁽¹⁾ toward the source (2) at right angles to the line between source and horn (3) directly away from source.

Results. There seemed to be very little difference in the intensity of the sounds heard for these three positions of the horn. With the horn pointing



No. 203
Ed. 10-26-15-1,700,001

toward the source, the sound was most intense but, to repeat, there is very little difference in the intensity of the sound heard for a revolution of the horn through a complete circle.

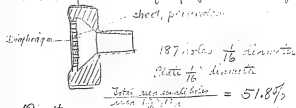
Patty. Hayes & Evans.

Mar. 17, 1918

Experiments given by Mr. E.

- 1- Try large diaphragm - don't go too deep.
- 2- Try diaphragm on tube alone and then just how the same as in air recording.
Large diaphragm Peak 450 feet
submerged 2 feet 6 inches
Also.

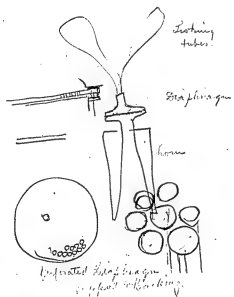
- 3- Try rubber diaphragm mounted on backing. The backing to consist of a perforated sheet of material sheet, perforated.



Results:-

Distance 1000 feet bell can be heard 550 feet. Putting diaphragm deeper into the water seems to increase the sensitiveness of our instrument. Thus at 550 feet with diaphragm 18" under surface the bell was not heard, submerging to about 4 feet the bell could

12



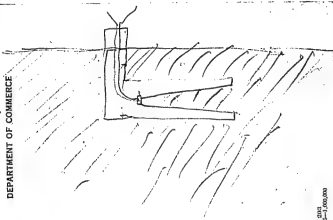
13

be careful the distance of the tubes

4- Try horn with short tubes and not entering
tubes close to the center of the horn

14

DEPARTMENT OF COMMERCE



U.S. GOVERNMENT PRINTING OFFICE

15

5(A) Saw through the stem and all of the connecting tube under water with an air line down.

Under water the hole was about 100 ft. deep. Some of the water was in the hole and some was in the air line.

The hole was 2 1/2 inches deep. 1 "smaller hole" was made in the middle of the hole. "Hole at depth of 7000"

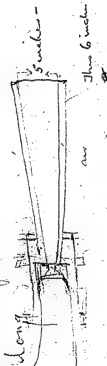


5(B) Pumped air in from the water there having a vacuum in the water and inside pipes. Vacuum 20 inches.

Don't know if the air is going in there the outside water is not in the hole.

Haves -

Double funnel should be 60 inches



Double clip to funnel

This should give you 1250 ft

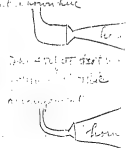
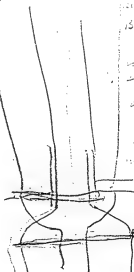
Make sure they were informed they

116

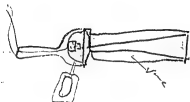
Have a diagram that is a diagram in drawing
on opposite page (p. 116) is a diagram

Then suggested before
another than shorter he
Bolt could be used only 4 ft
Bolt - but the
is not there the
the way I think not in
the way I think

No amount would
pattern with this one
must a better one



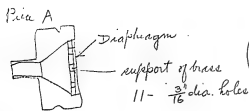
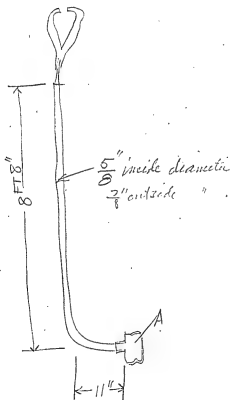
18

700, 000
R&B-25-15-1000000

DEPARTMENT OF COMMERCE

19

Z This apparatus is a transmitter consisting of a transmitter mounted on a platform for distance with funnel-shaped antenna to find the best position for the antenna.



March 11
 tried out rubber line since previous results
 not promising.

Results could hear Morse Bell at a distance
 of 450 feet.

Diaphragm about 3 feet diameter surfaces.

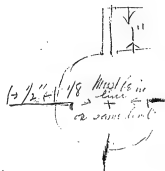
Also tried out apparatus shown on opposite
 page.

Diaphragm used — a stretched piece of
 stretched down rubber. An apparently much
 thicker, heavier material seems to give better
 results than one made of light material, such as
 galvanized iron or tin. That made from heavier
 material is quieter and therefore more effective
 than one of lighter material.

Distance 1100 yards of line at 650 feet.

No horn used. Diaphragm submerged 3 feet.
 The horn had a hole — 16 in. dia. ^{distance} _{from} ^{to} _{the} ^{water} _{surface} = 71 ft.
 It seems to us that an arrangement of water
 built from heavy material, that is, with
 all of greater thickness, will give better
 results.

Harry Hayes & Son



1 7/16
Hole 3/32



Contacts
bent in
Copper if
possible

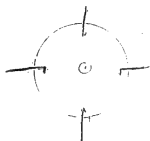
Shape of contacts all
4 in. sides. Contact down in
bottom contact straight

Et

A. Garbo da
U.S.S. K. 3
C/o Post master
New York

for Packages.

O.D. Payne.



$$(m^2+1)x^2 - 2Ax + A^2 - R^2 = 0$$

$$x = \frac{2A \pm \sqrt{4A^2 - 4(m^2+1)(A^2 - R^2)}}{2(m^2+1)}$$

$$x = \frac{A \pm \sqrt{A^2 - (m^2+1)(A^2 - R^2)}}{m^2+1}$$

Solve for y:

$$x = \frac{1}{m}y$$

Subst in eqn. (2)

$$\left(\frac{y}{m} - \cot x\right)^2 + y^2 = r^2 \lambda^2$$

$$\left(\frac{y}{m} - A\right)^2 + y^2 - R^2 = 0$$

$$\frac{y^2}{m^2} - \frac{2Ay}{m} + A^2 + y^2 - R^2 = 0$$

$$(m^2+1)y^2 - 2Ay + A^2 - R^2 = 0$$

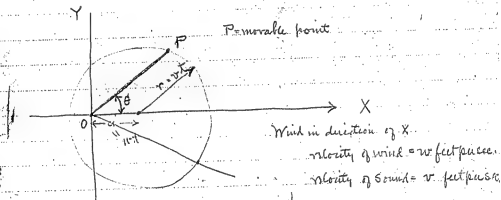
$$y = \frac{2Ay \pm \sqrt{4A^2 - 4(m^2+1)(A^2 - R^2)}}{2(m^2+1)}$$

$$(m^2+1)y^2 - 2mAy + m^2(A^2 - R^2) = 0$$

$$y = \frac{mA \pm \sqrt{m^2A^2 - (m^2+1)m^2(A^2 - R^2)}}{(m^2+1)}$$

$$= \frac{m \{ A \pm \sqrt{A^2 - (m^2+1)(A^2 - R^2)} \}}{(m^2+1)}$$

y = m x



$$(1) \quad (x-a)^2 + y^2 = r^2$$

$$a = wt$$

$$r = vt$$

$$(2) \quad (x-wt)^2 + y^2 = v^2 t^2$$

$$(3) \quad \text{Eqn. line OP} \quad y = mx \quad m = \tan \theta$$

Substitute (3) in 2

$$(x-wt)^2 + m^2 x^2 = v^2 t^2$$

Now consider particular equipotential line where wt and $v^2 t^2$ become constants. say A & R . [R = radius]

$$(x-A)^2 + m^2 x^2 = R^2$$

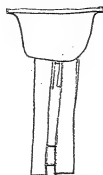
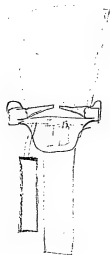
$$x^2 - 2Ax + A^2 + m^2 x^2 - R^2 = 0$$

$$A = wt \quad \text{Wind}$$

$$R = vt \quad \text{Sound}$$







**Notebook Series -- Notebooks by Edison and Other Experimenters
Group 5: Battery Experiments (1914-1919)**

These seven notebooks were used primarily from 1914 to 1916, although one book was used as late as 1919. The majority of the entries are by Harold H. Smith. The books contain data on battery cell tests performed at Edison's request. Some notes indicate an experiment number, a tube number, and different preparations of iron or electrolyte. There are a few comments by Edison and other evidence of his oversight, including mention of Edison as the person who "cuts out" the cells being tested. Also included are experiments relating to efforts to regenerate used storage battery components, such as pockets or tubes. Much of the work in these books is summarized, tabulated, or described in N-14-04-26 and N-14-12-03, Notebooks by Edison.

The one selected book contains several notes by Edison with no clear summary in his own notebooks.

N-Number

Label or Inscription on Front Cover or Flyleaf

Selected Book

14-06-02

Books Not Selected

14-05-16.1

"TAE Experiments HHS Notes"

14-11-28

"T.A.E. Experiments Index 1914"

15-01-11.1

"TAE Experiments Index -1914-"

14-12-14.1

"TAE Reports I 142E-381E"

14-12-14.2

"TAE Reports II 385E-892E"

19-02-15.1

"T.A.E. Reports III"

**Notebook Series -- Notebooks by Edison and Other Experimenters
Battery Experiments
Notebook, N-14-06-02**

This non-standard notebook, which covers the period May-October 1914, consists of approximately 70 pages of loose notes that were at one time fastened together. Most of the notes are by Edison and Harold H. Smith, chief of the Battery Research Department. There are also notes by James F. Monahan, superintendent of the Edison Storage Battery Co., and by employees Harry C. Leonard and Robert Saville. The material relates primarily to experiments aimed at the rejuvenation or regeneration of used battery components. These experiments were performed under Edison's direction on iron from old negative electrode "pockets." The pockets were often reconstructed with treated iron. The experiments are related to the work in N-14-04-26 and N-14-12-03, Notebooks by Edison.

Approximately 70 percent of the book has been selected. The selected material pertains to the experiments (identified by "TAE" numbers) performed under the direction of Edison. The unrelated tests at the beginning of the book (identified by "Silver Lake" numbers) have not been selected.

6/23/14

H.C.

Put following to experiment on

Let test

TAE No. 156

1902

1902 A

1902

1902 A

232 - 238 inc.

W.H. Smith.

6/26/14

v/c

Let out the following 3
experiments

158.25

153

157

162

165

166

168

166A

212-230 inclusive

158.25

The Experiment

6/27/14

No. 239

1st run	Sec ma	1030-990
2nd "	"	1330-3070
3rd "	"	1315-2100

Ex Experiment

6/29/14.

No. 239

with new

1475 - 2245

will assemble 1st cell
with new Tin Cell examined
but appears O.K.

Record of 239 continued on
large sheet.

4/29/14.

H.C.

Assemble to Exp. 189 (J.B.E.
No. 239) with new his. It's
running very much lower than its
mate.

shot.

Run these pockets
several times more
Mr. Edison - accounts

348E

July 25-1914



You asked us put
some for that run low, on 10
hot runs. We have done
this with 4 pockets of this 2972

Before hot runs

At 750 ma. 1300-1187-1080-1000

" 400 " 1833-1700-1687-1707

Hot capacity (450 ma) 1300-1185-1190-1150

After hot runs

At 750 ma. 775-650-987-462

" 400 " 1255-1870-1270-560

We are holding these pockets
in case you want them for
examination or other purpose.

Smith

Smith

Wake up right away

(2) 4 packets of 2977 Mix Fe
with Otts 104 die

don't Corrugate

439¹/₂ 150-148
1140¹/₂ 149-148

(2) Also 4 with Otts

102 Die -

417¹/₂ 137 136
438¹/₂ 138 137

Smith -

Please answer
inquiry about that batch
of ^{red} iron that gave the bad
results sent today =

Also send me over

For H Oungis -

Feb. 29/2

7/27/14.

Mr. Edison -

Fe No. 2972 has
been used in regular calls.
I have handed your note to
Mr. Buchanan for attention and
per your request.

Min. all used up except
I was able to get 6 packets
for use with Fred C. C. C.
you called for 4 each - can
only make 2 each.

Cannot get the sample
you want. Will be over
soon to see you about it.

Smith

347 E

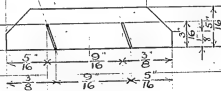
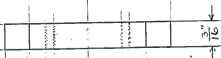
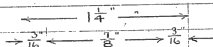


is the pressure
device pocket



8/11/15

Special Hard Rubber Amulators



8 wanted

Scale - Double size

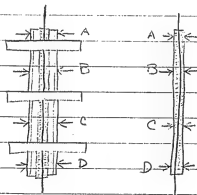
Please rush!

W. H. Smith

OK

347 E

Pocket 449 E in frame
450 E not in frame



Calipers

Before Test	449 E	450 E
A	.3650	.1215
B	.3620	.1195
C	.3617	.1217
D	.3645	.1235

#348E

Shut 1/2
197-2000

Box Time 2972

8/7/00

T50ma

	1	2	3	4	5	6	7	8
Regular	2333	1867	1753	1037	1587	1000	1713	1687
"	2100	2487	2000	1933	1100	1187	1000	1680
"	2001	2833	1967	1873	1037	1500	1027	1847
"	2002	2380	1780	1687	900	837	850	1690
Off No. 2 Box	437	2887	2193	2277	1412	1400	1537	2253
"	438	2880	2257	2320	1500	1550	1600	2387
Off No. 1 Box	437	2893	2393	2437	1600	1650	1637	2487
"	440	2620	2600	2693	1725	1775	1827	2747
g 1/5								

603

8/8/74

Received memo from Ted.
asking if any pressure used before
the die. Replied no but of course
slight pressure in pocket with no. 2
die.

204910]

~~Smith -~~

Smith -

Take 343 E + 344 E

+ Run them ~~say~~ same as you
run Reg. trans 3 at normal

3 at 750 rate, ^{4th} then keep

on running ^{at normal} till I tell you

to put on hat -

Σ

204910]

Aug. 10, 1914

Experiments

Mr. Edison -

I note per your
memo. that you want 343E
and 344E on regular Fe
schedule, that is,

3 at normal rate

3 " 750 "

Now normal until you
order them on lot.

They have already had
7 normal runs so I am
putting them on at 750 now.

Smith

Smith

Have you received

345 E 346 E from
McClair —

	345	346
1	65-50	75-100
2	less than 300	200-320
3	730-690	230-915

Aug 25/24

Mr. Mr. Lee

Received from Mr. Lee
for the use of the C. & G. Co.
that have negative plates, found
with no effect.

To Mr. #3011

will give me satisfactory results

in the future.

Capacity being about 1500 M-A-H.

Best at

1 Volt .5 Volt 1 Volt .5 Volt

Sp62 201.5 206.5 173 182.7

Sp63 202 207.5 173.5 183

Sp64

Research Dept.

Saville
Results of these tests
should be sent to me as
Mr. Edwards sees all others.

Cells "62" - "63" were analyzed and the
negative record with our div. - confirmed.
The electrical results account for an
those obtained on single tests and
think that this is due to poor form
I could not prevent from the chemical tests
enough of the same mass as we made
on "our" single test packets and
find that our "3011" which cells "62" - "63"
contain did not run over 1500 Mr. G.H.
packet loaded at Silver Lake.

We have two cells of "3011" this prepared
in regular way - analyzed in our test
will send you this report when complete.

Respect,

Monahan

For Unit # 11

Aug 31st

UIC #11 (7)

	Cell 51552	Cell 51553	Cell 51554	Cell 51555
	1 Volt	1.5 Volt	1 Volt	1.5 Volt
Run 1	201.5	206.5	202	207.5
Run 2	175	182.7	175.5	183

Reg. for Computed Sec.

	Cell 9210.B	Cell 9211.B	Cell 9212.B	Cell 9213.B
	1 Volt	1.5 Volt	1 Volt	1.5 Volt
Run 1	211.5	220	209	216
Run 2	185	196.5	187.5	193.7

Sanilla

Aug 31 1914.

Spiral Fe Mine #2106				
	1 Volt	2 Volt	3 Volt	4 Volt
Run 3	181.5	184	181.5	183.2
" 4	172	176.4	175	177.5
" 5	168.7	170.2	169.4	172.2
" 6	159		159	
" 7	170		169.2	
" 8	164.5		168.5	
" 9	164.5		170.5	
Spiral Fe Mine #2106 (47. Hg)				
	1 Volt	2 Volt	3 Volt	4 Volt
Run 3	174	181	175	182.5
" 4	166.2	173.7	167.5	176.7
" 5	165	174	165	174
" 6	155		157.5	
" 7	166.2		166.2	
" 8	163.5		165	
" 9	157.5		160	
"				
				253

Whitwell
Horse 2109 &
Whitwell 2106

Sept 1st. 1914.

Queth

Mark these cells
with my number

Special Ye. 9m #2109

" " " 2106

Reported yesterday up to-date.

Ye. 9m #3011

(Off die (#4.)

Sp. #62

RUN 3

" #63

" "

1 Volt.

.5 Volt.

165

178

161.5

177.5

Reg. Corrugated Die

1 Volt.

.5 Volt.

9210 B.

RUN 3

172.5

183

9211 B.

"

170

181.2

Savich

cal

9/3/14

R/C

Until further notice remain
Expts 7A E. 2m 335-336 E
at 35° F. Otherwise normal
stats.

Single B Fe plate
from J. F. M.



333 EX

✓ Press 2 B+ Plate with Ott #4 Die

334 EX

✓ Press 2 B+ with old convex die
first then convex with Ott #4
die

335 EX

2 B+ Plates with Ott #4 die first,
then press with flat die

336 EX

✓ Press 2 Plates in Ott #4 Thera
convex in old regular convex
die

Above is copy of Mr. Edison's note
to Fred Ott or Monahan.

Fred Ott =

Make 6-packets, 7 grams
Each irregular iron mix #3636
with yoffer #4 die + afterwards
press with flat die -

Tell Smith to use 2.
+ give first 5 runs hot at
130 Fahr & then run normal
+ number these 2 - #362 E

The other 2 packets are to
be run 1st 5 Runs cold
35° Fahr & then run normal
& marked 363 E

The 3rd 2. av. to be
run 5 runs at ~~normal~~
ordinary temperature get
at 800 rate. Then run
normal - Mark 365E



Je.

Smith-



Discharge the two X0333 P
to Zero + send cells to

Fred Ott =

Pockets cut away here by Fred
Ott & cells put in regular
man.

Mordhan

~~How~~ How you

getting on with B type
cramping die for
Leon

Expect to finish this die
on Monday or Tuesday
Mordhan

Have you finished the
A4's for Endurance
test with new die

Report on this sent
to you on Tues
M

Mr. Edison

Please send me your accounting
number for the following test

Moskoe

3664

6- B-H Cells 7.9 amp Pocket
Resistor 160 Tons New Computing-Div 000
Resistor with Flat in 120 Tons
Cells involved to distribute Lithium
Nov Sp 72 to Sp 77

B-H Cells

3674

6- B-H cells 5.3 amp Pocket
Resistor 80 Tons New Computing-Div 000
" Flat Div 60 Tons
Cells involved to distribute Lithium

Alt

Cell

High rate

from 1000

21/1

Further tests.

366 E (after 10 runs (last rate 477))

60 Amp. Dia. to 9 V.

90 " " " 8 V.

Cold at 30, 40 and 50 Amps.

367 E

7.5 Amp changing -

9/2/12

MC

708 343E - 344E

Point 441-2-3-4. PT

C. coll. test. PT 708 4.

441E

9-22-14

The Expts.

366 E	Run 2	6 Q 4 Cells
	1 Volt	1.5 Volt
	173	- 178.5
	118.5	- 177.5
		} out normal
		} In +
Run 1		
in 70	154	- 157
	156	- 159
		} at 130° E
	70	- 113
	70	- 1.4
		} at 35° E

1 | 1200 | 1200 | 12

366 E	Run 1.		6 AH Cels.
	1V.	.5V.	
Cells reworked	225	231	} all at normal temp.
to distribute	225.5	233.5	
Li OH	225	232	
Crystals	225	231.7	
	225	234	
	226.5	235	

Beginning with 2nd run these cells
will run as follows:

1st two at normal temperature

2nd " " 120° F.

3rd " " 35° F.

6123

Smith =

This dont look
right, & 2nd Run
Proves it apparently

Σ

Mark these 6 Cells
366A 366B 366C 366D
366E 366F

See reply on
large sheet report
for 9/25/44
C22

Fe

378E 7 gram packets 2 at
300 atmos pressure
Ct #5 die

379E 7 gram Cakes 2 at 200
atmosphere
Ct #5 die

380E 7 gram pks. 2 at 125
atmosphere
Ct #5 die

River Raq

9/28/44.

TAE # 240 A4 Cells ED-SP-A and ED-SP-B

" 351 " Cell # 25431

" 353 " Cells Sp 62 and Sp 63

" 354 " " 9210 B and 9211 B

Run all of the above cells as follows

3 runs, charge at 30 amp. to 100 amp. 5.8V.
Then 5 " Overcharges \rightarrow normal rate discharges
at 120° F.

TAE # 323X B-2c 1008-1009

" 334X " 1006-1007

" 335X " 1012-1013

" 336X " 1010-1011

Give these 3 runs charging normally
and discharging at 7.5 amp. to .5V.

TAE # 352 B4 Cells Sp 64 and Sp 65

" 355 " " Sp 68 " Sp 69

3 runs ^{over} normal charge discharges 30 amp. to .5V. (155)

9/30/4.

OKC.

ME # 358 Au cell Sp 70-71.

Charge 12 hours 30 amp discharge
at 100 amp to 0.5 volt per cell.

2AE # 375 Au cell Sp 48-49

Run at normal rates and 12 hour
charges at 35° Fahr.

at 100.

Smith

370 E

Put the Cells A &
without any Nickel plating
on Cold test

S

10/5/14

S/C

Put new line and new solution
with daily production for 1997 to 2000
inclusive.

~~copy~~

10/10/14

N.C.

Cut out JAE Exp. # 294. Tubes
non. E456 and E457.

JAE Exp. # 368. Tubes non. E528-E529
hereafter to run on regular
shot tube schedule

JAE Exp. 349 (J₂). Pockets 455 to 462
to run at 500 ma discharge rate
until further notice.

W.H.

October 1933

Smith Cut out 357E = 362E ✓
363E

Give 359 360 361 some 130° runs
some high rate runs 100 amp- ✓

Give some high dischg rates to 366 group
100 amp- ✓

What is 333X 334X 335X & 336X
I cant make out what they are. - ✓

✓ Find out from Anchor the loading weights
of 372 373 374 375 376 377 ✓
~~378 379 380 381 382 383 384 385 386 387 388 389 390 391 392 393 394 395 396 397 398 399 400~~

492

Smith

What are 367 group- ✓

Smith. Give 343 + 344 - ✓

Some 130° Runs + some 750 rate
runs

Stop Bismuth Cells where there ✓
are two #2 to each Nickel + have
Monahan give you some new Irons
made with the new #4 die giving
only Edge crimp - + go ahead
again

Open up 354 + 353. I think ✓
there has been a mix up, either
both have wires with the new
#4 die, or 353 is marked wrong
put them back on test again after
you have found out,

inspected +
found OK
and 1/2

10/14/66

H.C.

Put new Lin and new
solution in the Exp. packets 437 to
440 n.c. JAE # 348

stop.

TAE Expts

6/2/1914

343-

10/15/14

10/15/14

Order given
probably 10/15/14

JAC

JAE Exp 344

Packets 443-444

Give 10 hot runs 130°

Then put on regular schedule

JAE Exp 345

Packets 441-442

Cut out

JAE 357

Packets 449-472

362

509-510

363

511-512

Cut out

JAE 359

Av. Acc.

9367B-68B

360

F1-F2

361

F7-F8

Give 10 hot runs 130°

Then 3 normal runs

10 runs discharging at 100 Amp

Then 3 normal runs further discharge

② 10/15/14.

JRE #366 Au Cells Sp. 72 - Sp. 77.

Give 10 runs at 100 Rusp.

Then, normal until further notice
-CHS

Notebook Series -- Notebooks by Edison and Other Experimenters
Group 6: Miscellaneous Experiments (ca. 1916, 1918)

There are two notebooks in this group. N-Undated.4 was used, probably in 1916, for tests of musical instruments and parts. Most of the entries are by Absalom M. Kennedy, but there are also some notes by Edison. N-18-12-21 (not selected) contains lists of organic liquids, with notations by Edison regarding the solubility of lithium chloride (LiCl) and whether a "line" appears to indicate solubility. Some of the entries are probably by Ludwig F. (Louis) Ott. The results of the experiments in this book are summarized in N-18-11-26 and N-18-12-26.2, Notebooks by Edison.

N-Number

Inscription on Front Cover or Flyleaf

Selected Book

Undated.4

"Tests of Musical Instruments and parts"

Book Not Selected

18-12-21

"Li Cl Organic Liquid"

**Notebook Series -- Notebooks by Edison and Other Experimenters
Miscellaneous Experiments
Notebook, N-Undated.4**

This notebook was used by Edison and Absalom M. Kennedy, probably during 1916, for notes on experiments relating to violins and violin strings. The early entries (experiments 1-31) include numerous comments by Edison, particularly on the loudness of the recordings. The remaining entries (experiments 32-176) simply list the instrument or string and provide no comments; these have not been selected. The front cover is labeled "Tests of Musical Instruments and parts." The pages are unnumbered. Approximately 65 pages have been used.

Tests of Violin "E" Strings

STEEL

L.H. Damascus #54

Rox

#1

#2

#3

SILK

Rot/ Silk #1042

Rot

#4. Very impure -

- #5. ^{much} louder than 4. most
notes pure, some impure -
high notes audible when not
in 4. ^{notes even Volume} variable —
#6. not quite so loud as 5 = more notes
^{impure uneven Volume}

R. Anglon Braided Silk Rot

- #7. Fairly pure - Volume variable.
at one spot enormous. Variation
of Volume as go up in scale
starting at one note drops 3 or 4
times weaker beyond steadily

- #8. Even Volume (Very) no sudden
drop - notes fairly pure
about like 5 - Very good
string -

Even in Vol. loud - 2 notes
impure - ~~one~~ one very bad note
62 bowing (as then there is)
good string -

QUT

R. A. Cremonesque Tied #426 ^{R. A.}

- #10 Very loud - loud but yet
family even but only one place
going high it suddenly changes +
not so very - considering loudness
the notes are fairly pure -

#11 Very ~~loud~~ family even - only 1 note
impure -

#12

impure - Very uneven Volume

R. A. Cremonesque Tied #1450 ^{R. A.}

#13

#14

#15

GUT

Thomas Orchestra #1536 R.H.

#16

#17

#18

R.H. Equitone R.H.

#19

#20

#21

GUT

R. H. Equitone # 1546. R. H.

#22

#23

#24

Amerital # 1146. R. H.

#25

#26

#27

^{GWT}
Waterproof

Rest

#28

#29

#30

Albania

Rest

#31

#32

#33

GUT

La Fortissima

Roth

#34

#35

#36

Nicola

Roth

#37

#38

#39

GUT

Puretone.

LoH

~~#40~~

#41

#42

GUT

Z. r. r. Chromoneque # 1450

#13 Impure - loud
after reaching a high point &
while loud the note is
undulable - died it twice -
Poor string -

14 Not loud like 13 -
Sudden Change Volume on
high - slightly, impure notes
not good string -

15 Impure nearly all thin
not extra long, some variable
Vacuum Not good string -

~~Port~~ Port Cremonese #1426

10 = Even - fairly pure
loud - good string

11 = fairly even Valleys -
not low - but 2 high
waters extraordinarily
improve - poor string

12 = Very low, even -
only 1 high mile somewhat
improve - Very good string

Thomas Orchestra Rtt

16 Not loud fairly
Even volume 2 imper-
notes - Not good string

17 = fairly loud fairly
Even some imper-
notes - fair string

18 = little harder than

17. ~~for~~ Even - some
impure water - fair string

Equitone R & H

22 = Low - Even Val

Water nearly pure

good string

23 = Very loud -
notes uneven at different
points + not suddenly
on high - some notes
harpier - only fair string.

24 = fairly loud all
notes pure. Volume even
except last 2 notes - drop
considerable good string
Especially for purity.

Amerital test

#25 Not very loud

unpers in low -

quite deep in Valium on

last 3 hours -

Not a good study

26 = No test

27 = No test

28 Waterproof Rock

England - some
imperial notes, Valium
Varies all way thru

Not good string
except England

29 = Very low
fairly even & rather
pure good string

30 = fairly low
improve & fairly
even Val Not good string

31 = Albania RSH.
Impura - variable.
Valium Not good thing

[ITEM(S) FOUND IN BOOK]

Mr. Dawson -

We have the
following engagements
next week

Wed 8th Mrs. Packard 2 P.M.
Thurs. 10th Mrs. Curtis 9:30 a.m.

Kennedy

**NOTEBOOK SERIES
NOTEBOOKS BY EXPERIMENTERS
OTHER THAN EDISON**

Notebook Series -- Notebooks by Experimenters Other Than Edison

The eight groups of notebooks (796 books) in this subseries cover the period 1911-1929, with most dating from 1911-1919. About two-thirds of the books pertain to storage batteries. There are also eighty-two books relating to cylinder and disc records, as well as nineteen containing experiments on Edison's home projecting kinetoscope and kinetophone (motion pictures with sound). In addition, there are thirty-one books that were used during World War I for experimental work for the U.S. Navy and other war-related research; eighty-one books of chemical experiments; and a few books pertaining to electric vehicles and miner's safety lamps.

Within the six largest groups, related notebooks are arranged into subgroups, often according to the name of the experimenter. Among the Edison employees whose work is represented in these books are Leroy E. Briggs, Peter C. Christensen, Charles T. Dally, Frank Dettlef, Jr., William W. Dinwiddle, Elmer E. Dougherty, Zachariah P. Halpin, John A. Hanley, George E. Hart, William A. Hayes, Charles F. (Frank) Hunter, Miller Reese Hutchison, Absalom M. Kennedy, Ludwig F. (Louis) Ott, and Selden G. Warner.

Sixty-four books, which have indications of oversight or involvement by Edison, have been selected. The books are arranged in the following order:

- Group 1: Phonograph Record Experiments, 1911-1926 (82 books, 14 selected)
- Group 2: Kinetophone and Kinetoscope Experiments, 1911-1914 (19 books, 7 selected)
- Group 3: Navy and Wartime Research Experiments, 1917-1919 (31 books, 16 selected)
- Group 4: Chemical Experiments, 1911-1924 (81 books, 12 selected)
- Group 5: Electric Vehicle Experiments, 1911-1919 (9 books, 1 selected)
- Group 6: Miner's Safety Lamp Experiments, 1914 (2 books, 1 selected)
- Group 7: Battery Experiments, 1909-1929 (549 books, 6 selected)
- Group 8: General Experiment Books, 1912-1922 (23 books, 7 selected)

Notebook Series -- Notebooks by Experimenters Other Than Edison
Group 1: Phonograph Record Experiments (1911-1926)

The eighty-two notebooks in this group cover the period 1911-1926. They were used by Charles T. Dally, F. Detlef, Jr., William W. Dinwiddie, Archie D. Hoffman, and Sherwood T. (Sam) Moore, and other Edison employees. Occasional notations by, or instructions from, Edison indicate his attention to their work. The experiments in these books pertain to the development and improvement of cylinder and disc phonograph records. Fourteen books with indications of oversight or involvement by Edison have been selected in whole or in part.

The notebooks are arranged in eleven subgroups:

1. C. T. Dally Disc Blanks Composition Books, Nos. 1-14 (14 notebooks)
2. W. W. Dinwiddie Disc Books (12 notebooks)
3. Disc Plating Books (16 notebooks)
4. Record Varnish Books (5 notebooks)
5. Cylinder Books (3 notebooks)
6. F. Detlef Disc Books (3 notebooks)
7. Miscellaneous Disc Composition Books (8 notebooks)
8. W. W. Dinwiddie Disc Mold Books (3 notebooks) [not selected]
9. Record Inspection Books (7 notebooks) [not selected]
10. Blank Transfer Inspection Books (3 notebooks) [not selected]
11. Miscellaneous Experiment Books (8 notebooks) [not selected]

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
C. T. Dally Disc Blanks Composition Books, Nos. 1-14**

These fourteen notebooks were used by Charles T. Dally and one unidentified assistant during the period 1918-1924 for experiments on the composition of disc record blanks. The research documented in these books ranges from tests of waxes, clays, and other compounds for discs to experiments on strengthening the blanks. Included are notes describing how the discs performed after being varnished, pressed, and printed in various ways and with different schedules. Many of the blanks were reinspected up to five years after they were produced, and there are brief comments on their condition by various unidentified employees. Some of the mixes tested in these books were subsequently used by William W. Dinwiddie in his experiments (see the W. W. Dinwiddie Disc Books).

Also included are notes on "drop tests" in which the discs were dropped to test their durability. Two entries in N-19-01-08 indicate that Edison tested the surface of the blanks produced for those experiments and performed some drop tests. A few brief comments by Edison on one of the tests can be found in a loose note inserted into that book. Some early notes on disc composition experiments can also be found in N-17-00-00.6, Notebooks by Other Experimenters—Navy and World War I Experiments—Miscellaneous Books.

One notebook, representative of the work in the other books but more heavily annotated by Edison, has been selected. A loose item containing instructions from Edison, inserted into another book, has also been selected.

<u>Book #</u>	<u>N-Number</u>	<u>Labels and Inscriptions on Front Cover</u> <small>[additional information supplied by the editors appears in brackets]</small>
Selected Books		
2	18-09-14	"Disk Records No- 2 Book"
5	19-06-03	"Exp on Blanks 5" [loose item only selected]
Books Not Selected		
1	18-02-06	"Dope for Records No-1 Book Feb-6-18"
3	18-11-13	"Records No-3 Book"
4	19-01-08	"Exp on Blank for Disk Record No-4"
6	19-10-07	"Exp. on Blanks No-6"

7	19-11-19	"No. 7"
8	20-01-28.1	"No - 8"
9	20-10-09	"No - 9"
10	21-07-19.3	"No. 10"
11	21-11-15	"Nov 15-21_ + + No - 11 Exp. on clay Blanks No - 11"
12	22-06-02	"May 22 - 22 Exp on Blanks No - 12"
13	23-05-24.2	"Exp on Blank June 29 - 23 No - 13"
14	24-10-20.2	"Exp on [Blank?] No - 14"

**Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
C. T. Daily Disc Blanks Composition Book 2
Notebook, N-18-09-14**

This notebook was used by Charles T. Daily during September-October 1918 for numbered experiments on disc blanks. There are also a few separate pages of notes by Edison, along with one note by Edison inserted into the book. The entries describe how each disc performed after being varnished, pressed, printed, or dropped. They frequently indicate numbered "mixes," some of which are identified as "TAE" mixes. The research in this book is representative of the work in the thirteen other books in the group. The front cover is labeled "Disk Records No- 2 Book." The pages are unnumbered. Approximately 120 pages have been used.

No-1

40 Rosin
11.7% S. Oil
150 S. nap
300 clay
no strength

No-2

60 Rosin
11.7% S. Oil
150 S. nap
300 clay
no strength

No-3

80 Rosin
11.7% S. Oil
150 S. nap
300 clay
Breaks easily with fingers

No-4 100 Res

11% S.Oil

150 S. drop

300 Clay

Just about breaks it with fingers

Breaks at 2 ft drop on Blotting paper

No-5

120 Resin

11% Straw Oil

150 S. drop

300 Clay

and put through 190 mesh

Pressed into blimps

5 mil corn at 250 F

3 11 Hgts 195 lbs Res one side Pullouts one

Breaks on drop test 2 ft on blotting paper

th 6

140 Posin

11. S. O. L

150 S. drop

300 clay

Swind, fair through 190 nest

5 min com at 250

5" High 195 Pass } stuck a little on one side

Break at 2 ft drop on Blotting paper

7

140 Posin

11. S. O. L

150 S. drop

300 clay

5 min com at 190

3 " " " Pass 195 ft

Stuck a little on one side

#8

160 Rosin

11% S.Oil

150 S. Nap

300 clay

Pressed at 5 min com at 190°F

3 High " " 195-4 Press

Pull out

#9

180 Rosin

11% S.Oil

150 S. Nap

300 clay

Hard to powder it - sticks together

10

160 Rosin
11% S oil
150 S nap
145 Chalk
5 lb com at 190 F
3 " High " 195 Pans
Pan Break with fingers

#11

160 Rosin
11% S oil
75 S nap
75 Rotten stool A X
5 lb com 190 F
3 " " 195 Pans
No Pullants
Breaks easily on drop test

12

160 Puro
11 1/2 S. Oil
95 L Drop
750 Rottm. L. tone AX
52 in con at 200 Ft
3 " High " 195 Puro
no pullouts
Broke 2 ft drop on hitting paper

13

100 Puro
11 F. S. Oil
100 L Drop
300 clay
Through 190 mesh -
5 in con at 250 Ft
3 " High " Puro 195 L. t.
slight pullouts
Broke 2 ft drop on hitting paper

#14

150 Pssn

11 1/2 S. Oil

6 1/2 fl oz

5 min com 250 ft

3 " High " Press 145 - Pullouts streak

stood drop test on bitting paper

Broken at 11 ft floor drop

#15

160 Pssn

11 1/2 S. Oil

95 S. drop

400 Rottm stone (1 sample)

5 min com at 250

3 " High " " 195 lb Pssn

Broken on first drop the blotting
paper

#16

160 Rosin
11 1/2 L. Oil
75 S. Soap
200 Kisselgan
5 min. con at 250 F
3 " High " Press 195 lb

No Pullouts
Leak break on heating pipe
Broken at 4 ft above floor

#17

160 Rosin
11 1/2 L. Oil
75 S. Soap
150 Kisselgan
5 min. con at 250 F
3 " High " Press 195 lb
Rosin squeezed out - extracts to mold

#18

160 Rossin

11% S. Oil

75 S. Soap

900 Litterphone

5" in core at 250 Ft

3 " High " " Press 195"

Broken on drop test 2 ft on blotting
paper

#20

150 Rossin

11% S. Oil

75 S. Soap

6% flock

300 C. Clay

5" in core at 210 Ft

3 " High " " Press 195"

Small fullouts

OK on Blotting paper drop test
Broken on 2nd drop on floor 11 ft

21

160 Rosin
11% S. Oil
75 S. Nap
200 Kisselgan
Dried Put through 190 Mesh
5 in low at 250 F
3 " High " Press 195
No Pull outs
Dropped 3 times on floor before
Breaking

22

160 Rodin

11 1/2 S. Oil

150 S trap

300 Kieselgan

5 min cone at 250

3 " High " " Press 195"

Slight pull onto surface not
skinned

Printed at 300 F.

3 min cone with ferris

2 " High 220 " "

not full print

drop on first floor drop test

23

160 Rosin

6% flops

11% S. Oil

150 S. Soap

250 Kisselgum

Dried ground in mortar tried to
sieve through 60 mesh. flops
stay on screen. tried off in
mill m. s.

Ground in mortar made
blank without screening

22g pressed at 125 lb 304 F temp 307 thick

20g " " 310 " 285 "

18g " " 310 " 277

Varnished & Baked in 24 Alcl
varnish did not soak in, no more
bubbles on than there was when varnish
Printed one at 800 F 200 lbs per
varnish cracked some pulled away
from blank taking some of Blank
with it

Second one stuck to mold
pulled all apart

24

160 Rosin

6 1/2 floss

11 1/2 L. Oak

200 S. Soap

250 Kisselgum

bind 2 inches from union plate
in pipe plate

Looks different from No 23
looks whiter also looks as if it
should have the extra V shape
Same as No. 23 pulled apart

#25-

150 Rosin

11% S. Oil

75 S. Nip

3% flock

300 Clay

Pullouts

Varnished and gave Reg Baker in 20

Pressed 80 lbs at 300°F

Blank squeezed out sticks pulled apart

26

150 Rosin
11% E. Oil
75% E. nap
6% flock
300 Clay

#27

150 Rosin

11% S. Oil

75 S. Soap

9% flock

300 clay

sticks were molded

varnished with Reg. Paste

Pressed at 100 lb. 3/16" to much

finer sticks - pulled apart

#

28

150 Rosin

11% S. Oil

75 S. Soap

12% flock

300 clay

#29

120 Resin

11% S Oil

75 S Nap

300 clay through $\frac{1}{8}$ = shale

6% flock

Made Blanks 250 $\frac{1}{8}$ 125 lbs

5 in com

3 " High, 25 lb Press

1 little pullout on one side
surface somewhat porous. not
ground fine enough

Varnished + Baked in 2 + bld.
looks like the var. soaked in
the porous places

Print

2 min exp at 315°

2 " to reach 150 lb Press

5 " at 150 " 225°

$\frac{4}{5}$ th of Print was OK & did not get
the pressure. when it is printed it
is a full print

Break 3 ft on table third drop

#30

100 Rosin
11% S Oil
75 S nap
6% flock

Not ignited though
for hole

300 clay
made Blanks

5 min con at 300 F

8 " High " 125 Press

Somewhat porous

Would have a shiny surface
if ground fine enough

Var. and baked in 2nd Bed

Surface looks rough.

Print

2 min con 500

2 " to Press 330 + 200 lb

8 " at " 200 lb Press

Some of the porous spots showed,
fine print where it is good

Broze on 2nd drop

#. 31

80 Rosin

11. S Oil

75. S drop

6 1/2 flock

mix. dyed (thru)
82. hole

300 clay

5 min corn at 300 F

3 "

"

125 Press

Porus slight Pull out on one side
bar + Packed in 2nd Rd

Surface looks rough

Print

corn cone at 300

2 " to reach 330 at 200 lbs pressure

5 " at " " " "
A little hard to extract. Varnish loosened
at a couple of places - a few cracks in
center - full print

Varnish cracked more after standing

Broken at first drop

32.

60 Rock

11% L oil

75 S drop

6% flock

300 clay

5 min con at 800 ft

8 " high " 125 lbs

no Pullouts

Porus

for + Pinter in 24 Rd

Looks porous

But

2 min con at 800

2 min to reach 800 at 830 ft

Pulled apart when extracted

cracks at first drop

#33 Printed

2 min con at 300

2 " to get to 200 pressure at 310

8 " at " "

Good print no pullouts - except on outer edge I think it sets to deep in mold. Broke on first drop on floor 2 ft

#34 Print

2 min con at 300

2 " to reach 125 pressure at 310

8 " at 200 " "

Good print outside edge traps

ff

Broke third drop of floor 0 ft

#3

" 29 mix Powdered put through 30 mesh screen Surface not all filled porous slight pullout on one side

5 min con at 310 f

3 " High " " Pressure 5 lb

• 248 thick

#34

29 mix Powdered put through 40 mesh screen

5 min con at 310

3 " High " " Pressure 5 lb

Looks fair not very porous one very small pullout

253 thick

#35

Printed

2 min con at 300°

2 " to reach 150 Press at 310°

8 " at " " "

Full print outer edge pulls out
Breaks at third drop 2 ft from
floor. don't break dripping 2 ft from
bleeding paper

Printed

2 min con at 300°

2 " to reach 150 Press at 310°

8 " at " "

Full print. outer edge pulls out
matrix's don't fit. mold holders
tight enough

dropped four times before breaking
cracked at third drop - 2 ft from
floor. don't break dripping 2 ft from bleeding paper

#35

29 min through 50 mesh

5 min con at 300°

3 " High " 310. Press with

Small pullout on one side
slightly porous. can't see it
by eye

1.254 thick

#36

29 min through 60 mesh

5 min con at 300°

3 " High " 310 Press with

Pullout on one side

No-37

Printed

2 min com at 800

2 to Reach 180 lb Press 320°

8 min at "

Squeezed out let mold come together
struck on one side

P. 11

Set test

2 drops on floor at 5 ft. Plof.

#38

Printed

2 min com at 800°

2 to reach 150 lb Press 320

8 min at "

One side of mold cracked stuck
on edge

Drop test

3 drops on floor at 5 ft. Press

#39

120 Rosin

11.1% S. Oil

75 S. nap

9 flock

300 clay

Rather dry, hard to mix with
Squeint through 1/2 hole
the powdered put through 30 mesh
screen

#38

120 Rosin

11.1% S. Oil

75 S. nap

12 flock

300 clay

#39

Print

2 in corn at 3000
2 " to reach 150 lb at 320
8 " at " "

OK

Drop test

2 drops at 6 ft on floor broke

#40

2 in corn at 3000
2 " to reach 150 lb at 320
8 " at " "

OK

Drop test

2 drops at 5 ft on bare floor broke

#

39

120 Pos
11.1% S. Oil
100 S. nap
15% flock
300 clay

#40

120 Pos
11.1% S. Oil
100 S. nap
18 flock
300 clay
Slight Pullout

#41

Print

2 min con at 300°

2 to reach 150 lb Res at 320

5 at " "

OK

Drop test

10 drops on bare floor at 3 ft

7 " " " 5-11-13 etc

#42

Print

2 min con at 300°

2 " to reach 150 lb Res at 320

8 " at "

OK

Drop test 2 ft drop on blotting paper 11 drops

" 2 " " " bare floor 3

" 5 " " " 2.5 ft

#41

120 Rosin

11.1% Oil

115 S. hop

21 Flock

300 clay

No Pullouts

#42

120 Rosin

11.1% Oil to the Rosin

115 S. hop = 99 grams

24 flock

300 clay

No Pullouts

Nos. 37, 38, 39, 40, 41 + 42 Squir through
1/32" hole the powdered screen not through
coarse screen

#43

120 Rosin

11.1% S. Oil

150 S. Nap

48% flock

300 clay

Could not agitate it. flock not
separated when mixed. Balls up
when mixed

#44

120 Rosin

11.1% S. Oil

120 S. Nap

48 flock

300 clay

N.B. flock stays ball'd up

FF
45~

120 Rosin

11 1/2 S Oil

200 S Nap

48 Flock

300 Clay

N.G. Flock stays in balls - don't squirt
plugs

No-46

120 Rosin

11 1/2 S Oil

115 S Nap

30 Flock

300 Clay

Just about right - it through's & sticks

#47. 120 Rosin
11.1/2 S.Oil
100, S. nap
35.1/2 Flock
300 clay

#48

Painted

Con 2 min at 300

2 " to reach 700

Held 8 " at 700 - then cooled

2 small bulbouts

Surface time probably more

Average thickness .263

253

King tub

242

623 grams

273

265

1653

2.37 grams per $\frac{1}{1000}$ thick

wanted .200

237

444.56 g per Blank

Drop test

10 times at 1 foot

2 " " 2 feet - Backer on last drop

#48

Made a large Record of 20 + 2 min

Used 630g in mold

5 min con at 300°

3 " high 450 lbs 310°

Stuck both pullout on both sides
most of the pressure on center of
blank

Varnished + Backed in 24 sec

The part marked in sketch was
covered with large blisters underneath
was cracks and full of pimplesGeneral surface was pimply
on outside edge at two foldovers
varnish was off blank where it
rested on Rack)

#10-49

120 Rosin

11 1/2 S. Oil

115 S. Nap

10 g. ~~Stearic~~ ^{Stearic} ~~Alcohol~~ ^{Alcohol}

300 C. Clay

Mix good Black

No-50

120 Rosin

11 1/2 S. Oil

115 S. Nap

5 g Lamp Black

300 C. Clay

Good Black

#57

44.44 g. used for Blank - through 30/11/10

Cat. per. 195

195

199

261

11790

197 average

51

Made Large Record 11542mg
Blank

5 min con at 310°

3 " High " 450 lbs press 315°

Stuck on both sides

Edged

Give 1 coat of varnish let dry in
air one hr then put in oven for
1 hr at 110° then 1 hr to reach 150°
2 hrs at 150° then second coat of
var then let stand 1 hr before
going in oven then give Reg Bate
Blank Blistard

T, a, e, dont
think it was
quite
long let

smooth coming
out of press
just before



#52

No. 42 Mill through 20 mesh
screen. Large blent
5 min. on lat 310°

3 " High 550 lb. per 310°

53

No-42 mix ^{set at 1/2}
 Put through small Rolls, in 4 Red
 one roll hot other hot to prevent
 mix from sticking
 Baked in oven all night at 240
 (not var. over) shrunk in diam, some
 Put two together in Reg Powder Blank
 molds

Pressed

5 in cone at 305°

3 " High 550 lb Press at 305°

Stuck to plates made a better Block
 than by using powder.
 average thickness .188

Varnish

Give one coat of var. let it dry in
 air 1 hr. then put in oven for
 1 hr at 190 then one hr to red heat
 130 hold 1 hr at 130 in air
 2nd coat let stand 1 hr then
 Give Reg Bake. come out OK

Printed

2 in cone at 300°

2 " 6 inch 800 lb Press 325°

5 "

at " " " " " " " " " " " "
 Surface good a few nicks on side better
 than other

#34

4274

Blanks made of bot under
two pieces of leather
Stood in oven all night at 140
then put in vac oven for 3 hrs at
85 steam pressure 12 in. vac
Pressed without heat to 2000 lb
Varnished. Let stand one hr
then put in oven for 1 hr at
110 then 1 hr to reach 130
hold 1 hr at 130
Some small Blisters in blank
after first Baking
Second coat of Var then Reg
Bake - Blisters disappeared on Reg
Bake

#55 Sup of 5-4 Except
after pressing at 200°C lb
repressed 5 min soon at 175°
3 " high " 350 psi at
175°
First coat Reheat - OK

#56

120 Rain

11 8 Oil

115 8 Vap

24% flock

400 chalk

N. 6.

#57

120 Rosin

11 S Oil

115 Benzol

24 1/2 flock

300 clay

Nov-58

1st coat of var

1 hr air dry

1 " in oven at 110

1 " to reach 120

1 " shield "

2nd coat

1 hr air dry

then var. bake

Vanilla Blistened

Blank - 211 all raise up 00

2nd - Pig Blist

Vanilla Blistened

Printed - Pig - checked

Surface Bake

after 4 hrs. - long blank blistened

58

120 Rodin

11% Oil

115 Alcohol - 2000

24% flock

300 Clay

Grid 21

Made Blanks on Leather of Gob

dryed in var oven - 24% in 1 hr var

Blank was blistened after baking

put in mold give 2000 Blist. looks good

10-59

120 Run

11% Oil

50 Soap

24% flock

300 chalk

Small mixer

#60

120 Ros

11% S. Oil

50 S. nap

24% flock

300 clay

2 Large Men

#61

120 Ros

11% S. Oil

90 S. nap

24% flock

300 clay

H
62

120 Ros

11% S. Cil

80. S. Drop

24% from R

300 clay

PK

63

120 Poo

11% D. oil

50-cc Alcohol

24% flock

300 . Clay

64

120 Pae'

11% S. Oil

Sol vap. ? to much
dont know weather its 500 or 1000

2.5% flock

600 / chalk

Min was dried on steam plate
all crumbled up some of the lumps

fig as 3/4

molded

5 com at 300°

3 high " 450 to 510°

surface porous

11.5. Saged in oven

Bake

Let stand 1 hr in air

1 hr at 110° in oven

1 " to reach 130°

Held one hr "

Lt

65

2 Blankets of No-63 Mif

Pressed to within 1/2 inch

dried in vac at 12 - 24" vac

1 hr without heat

1 " with " no pressure

1 " " 20 lb. pressure

1 1/2 " " 40 " "

1/2 " Cool with water

Both blankets raised up

Put in oven at 250° F for 1 hr

Pressed in cold mold at 2500 psi

1 had a pull out

1 Coat of Varnish

let stand 1 hr in air

put in oven 1 hr at 110

1 hr to reach 130

Hold 1 hr at 130

then give second coat let stand 1 hr

third given as before

Blank slightly blistered

#66, Black - No 63 mold
made Black in mold, 1500 lb Press
paper on mold plates (bind in vac. full
1st coat of var # Raisins)

let dry 1 hr

then in oven 1 hr at 110°

" 1 hr to reach 130

Hold 1 hr at 130

2nd coat var

let dry 1 hr before going to oven
then give reg. heat.

Raisins in plates not anymore

67

120 Resin
11 1/2 Oil
25 Alcohol
24 1/2 flocc
300 Charle

68

120 Poin
11 1/2 S.O. 2
25 Alcohol
24 1/2 floss
400 Rottstein AX

69 *

120 Resin

11% S Oil

25% Alcohol

24% flock

Nb Kieselgum

#

70

120 Robin 27.1%
 24% flock 5.4%
 300 Chalk 67.5%

for Blanko

#

70-A TAE

1500 wood fibre

1140 chalk

420 Milled Robin

all wood fibre in with rosin
 after 5 min cleaned mixing arms
 then every 15 min pit in 285 chalk
 screened through 20 mesh
 Van Ry Patent Dry

Made 5 Blankos - 2 Blankos looks as if
 they only had 1 coat of varnish

#71 T & E Dip

540 Rosin
518 flock
2700 Chalk

Purify all flock + melted Rosin
the every 15 min 900 chalk (not good dip)
screend through $\frac{1}{16}$ mesh

3 Blanks made

Dry 2 coats of varnish Reg Baker
Rough ^{Pipe} trijke

72

5-40 Rosin

5-15 flock

27.00 chalk

FW 3.50 chalk - with melted Rosin

1.5 chalk

4.5 chalk

12.5 172 flock -

13.8 " "

2.2 " "

5-20 4.50 chalk -

4-40 4.50 " "

3-5 4.50 " "

3-35 fumbled

2 Blanks

#73

1/2 of No 72 Batch put through
coffee mill

Blanks smooth but can see
hard the spots. Bad mix

#74

600 Rosin

518 flock

2700 chalk

1350 g chalk all the method

Rosin

after running 5 min clean

doddles

Run 15 min more and clean

after running 25 min when mix is

like so add 172 flock

15 min more add another 172 flock

25 " " " " 172 flock

20 " " " 450 chalk

20 " " " 450 "

25 " " " 450 "

Then Run 30 min (finished)

75

656 Rpsin

518 flock

2700 chalk

Mixed the same as 74th

76

76

700 Rosin

5-18 flock

2700 chalk

Mixed the same as No 74

Var Reg No - 1841-E

$\frac{1}{2}$ Pint = 236 cc contains .94 g Para = 1%
add $\frac{2.82}{3.76} = 5\%$

$\frac{1}{2}$ Pint = 236 cc contains 7.56 g $\frac{6}{4} = 7.8\%$
add $\frac{2.06}{9.62} = 2.2\%$
10%

77 Varnish

add 2.06 g $\frac{6}{4}$ and 2.82 g Para
to 236 cc of Reg 1841-E Varnish
4 times as much para = 4% to Para
" " $\frac{6}{4} = 10\%$

Dissolved the $\frac{6}{4}$ & Para in
25 cc alcohol then filtered through
linen then added to the Var.

77. A Varnish - for Soft Blanks

5% Para

add 4.12 = 10% $\frac{6}{4}$ to 472 Varnish
" 7.52 = 5% Para

77. B Varnish = 2% Para

1 10% - $\frac{6}{4}$

add .94 g Para to 236 cc Reg Var
2.06 $\frac{6}{4}$

#78

Baking scheduled

$\frac{1}{2}$ hr at 110
 $\frac{1}{2}$ to reach 140
 $\frac{3}{4}$ to " 140
 1 " 150
 Held 5 hrs 150

 No-1 Baking
 Scheduled

#78

70 Blank with two 77 Vairid
 Bent over in oven at 150° F when
 baked

Straightened one on hot
 mold

Printed 2 min on 125-lbs
 10 min at 220°
 started to squirt out
 from molds soon as hand on
 gauge began to leave firm/gum
 Resin collected up through vacuum

78A

No-78

Printing scheduled

2 min on at 212

2 " at 190 to reach 250 Res

Squirt out when pressure reached
 about 400?

78-13

top of No 78 Except different printing
 scheduled

2 min on at 150

12 " high 125-lbs press at 150 to 155°
 about as high pressure as it will stand / before wear

No-79 mix same as no 70 except use
dry instead of chalk
960 Rosin =
230.4 flock =
2400 clay =

NG
To dry

#80 - Printing scheduled

2 min. con. at 220°

12 " High " 100 Press. 220°

Few small spots not full print

Blank squeezed out about 1 3/4 inch

OK for ware at 20 times

Drop that 53 times one foot high

No. 80-A (Printing scheduled)

2 min. con. at 200°

12 " High " 125 lb Pressure 200°

Shows ware at 5 times

No. 80-B (Printing scheduled)

Con 2 min at 150°

+ " High at 75 lb pressure 150°

then drop pressure to 75 lbs + raise

Temp to 235 for 10 min

#80-C

con 4 min at 160°

4 min High 75 lb pressure at 160°

then drop pressure to 75 lbs at 230°

for 10 min Varnish and Record wrapped

due to being wrapped broke on tem

#80-D

sup of No. 80-C wraps put a ring between
molds to prevent Record from squeezing out -

#80

70 Blank No. 77 Varnish

Baked

1/2 hr at 110

3/4 to reach 120

1 " 130
Hold 7 hrs at 140

#1 Scheduled

full print

Good full print

#81

~~to 110 Blank~~

~~no 77 Kinnich~~

~~" Baking Schedule~~

No - 1 Pressing Schedule

Bring to contact + hold 4 min.
when temp. has reached 160 by
thermometer on plate

Then keep temp. till 160

Raise pressure to 750 lbs Hyd.
static hold for 4 minutes

Then reduce pressure to 70 lbs
Hyd static + raise temp. to 230 +
hold 10 min - chill

(#70 mix)

120 Resin

15 Lbs glass

28.4 - flock

300 Chalk -

Weight out Chalk in 3
batches, have it all hot.

Put in $\frac{1}{3}$ rd of Chalk, all
the flock & all the

Resin, 1

Mix till perfect then
add $\frac{1}{3}$ more chalk
mix till perfect
then add final or last
 $\frac{1}{3}$ rd of Chalk & mix till
perfect.

1913

Baking Schedule No-2

1 hr to reach $110^{\circ} F$

1 " " 120

1 " " 125

1/2 " " 130

2 " " 140

Held at 140 for 8 hrs

#81

\$110 Blank

No-77 Varnish

11-2 Baking

No-1 Printing schedule

1000 Resin = 25.7%
248 Bottom = 6.1%
2100 Chalk = 66.9%

Saged a little when baked temp did
reach 145 for a few times
Squeezed out, ^{1 1/2 inch} when one temp pressure at
230 temp I think due to printing, soon as
taken from oven after straightening

82

\$117 Blanks { 1000 Resin 25%
280 Cotton 7%
No-77 Varnish { 2720 Shellac 68%
" 2 Baking schedule
" 1 Printing "

A little crooked after baking
~~at a full print on outside edge~~
~~Blank Blanks~~

#83 to 118 Blank (1000 Rosin = 25%
520 Cotton = 8%
2680 Chalk = 67%)

No. 77 Varnish

" 2 Baking schedule

" 1 Printing schedule

Don't look as if it's aged any
Not a full print on outside edge

Run Blank

H

84

8-119 Blank { 1000 Resin = 25%
360 Cotton = 9%
2640 Chalk = 66%.

No 77 Varnish

" 2 Baking schedule

" 1 Printing schedule

Did not sag any when baked
Not a full print. Red blank

One test 100 times OK

" 200 " shows a little wear

#85

#70 Blank Pressed in a Reg
Powder Blank mold

5 min cool at $180^{\circ} F$

3 " High at $75^{\circ} F$ press at $180^{\circ} F$

Pullouts on both sides (smooth surface)
Smooth surface after baking no blisters or
bubbles

No 77 Varnish

" 2 Bafar schedule

" 1 Print "

#86

No-70 Blank pressed in Pig Powder
Blank mold

5 min com at 165

3 " High 75. lb press at 165

Pullouts on both sides not bad as

No-85 (smooth surface)

not quite as good as No-85

87

No 70 Blanks put in oven without
Varnish Baked at No-2 schedule
then straightened

No-77 Varnish

" 2 Baked schedule

" 1 Print 11

Sept 14-18

#88

122 Blanket { 1200 Roan 30%
400 Cotton 10%
2400 chalk 60%.

← what says when Baked

No. 122, 123, 124, 125 and 126/
Blankets were varnished with before they
that was in ice box 3 days it looked
thicker than when it was fresh

No. 77 Varnish

" 2 Baking schedule

extra 1/2 + 1/2

#89

*123 Blanks { 1250 Resin = 32 %
450 Cotton = 12 "
2240 Chalk = 56 "

No-77 Varnish

" 2 Baking schedule

Printing schedule

4 min. con. at 180°

4 " High 75 lbs at 180°

10 " 75 lb. press at 230°

One side full of Pullouts

Other side no pullouts - only a few
spots not full print

Blank squeezed out 1/2 inches when
printed

#90

2124 Blanks

1400 Resin - 35%
600 Cotton - 15%
2000 Chalk - 50%

10-77 Varnish

" 2 Baker scheduled

91

to 125 Blank 1320 Rosin = 33 %
600 cotton = 15 "
2080 chalk = 52 "

No 77 Varrish

" 2 Baking schedule

" 1 Printing schedule except
High pressures 725 lbs

#92

*-126 Blanks 1080 Room ~ 27%
320 Co. Utter = 8"
2600 Shelf = 65"

~~No-77 Varnish~~

~~" 2 Baking. scheduled~~

No-77 Varnish

" 2 Baking. scheduled

" 1 Printing. not scheduled

not full print

93

126 Blanks

77 Varnished then put in Vac. for 2 mins.
at 20 inches of mercury, then let stand
15 min. before second coat, then
2 min in Vac 20" mercury

Then Baked No 2 Baked

No - 2 Bake schedule

Printing schedule

4 min. Com at 180°

2 " High 75 lbs at 180

10 " 75 lbs press at 230

#3 Bake schedule
for soft blanks
using 5% Para

1 hr to reach 110

1 " " 120

1 " " 125

1 " " 130

Hold 8 hrs at 130

#94 No 70 mix for Blomfas
Made with CO_2 gas going
in mixer when made, almost
when heat in oven

94A

No. 70 Blomfas made in mixer
with CO_2 then put in oven
without gas or pressure

95-

138 Lead Resonator

26.8 ft x 2

300 chalk

N L

96.

#126 Blank

No-77 Varnish

" 2 Paper

Printing Schedule

4-11-50 150°

2 " High 925 lbs 180°

then 10 min at 230° - 75 lbs pressure

#97. Blank

1200 Rosin

230 flock

2400 clay

not quite enough Rosin to dry

#98

1320 Rosin - 1650

230 flock

2400 clay

just about 1/2 in. of flock
and more into the flock
void

#99

not full print

stick on one side

varnish not cured - can mark it
with fingernail

#99

1420 Rosin = 177.5

230 flock

2400 clay

Got all the gobs off

No-77-A varnish

3 Bate

Pump schidval

4 ml at 180°

2 High 75 lb press at 180°

10 at 75 lb press at 250°

#

99A Sup of no 99 except printing color

4 min aon at 210°

2 " High " 750 lb at 210°

10 " 75 lb press at 230°

Varnish not cured. Stuck on ball.

is also
not full print. Squeezed out about
2 1/2 inches

100

~~4220 24 min~~
~~210 210~~
~~750 750~~
~~230 230~~

75-100

Mix for Blanks

12 Isosmit

5 mangak

10 Posit

No-101

Rimfeed - Cracked
Blank cracked - Pullouts
Printed Inspected
Oct 4 Nov 13

102

Rimfeed Blank cracked
Printed Inspected
Oct 5 Nov 13

101

No-100 mix 177.5g - 35%
28.8 flock — 5.6%
300 clay — 59%

1 coat of Varnish with 2% Benz. 10% to
Drive Rag. Raked in 24 fold.
Rag Pulling in 100% - Very little more down
Did not take to mold but hard to
get out of mold. Use 2 rings to make
mold deeper
Cracked and puffed out

102

No-109 mix 165g 33.3
28.8 flock 5.3
300 clay 60%

Made into 24 fold and let
cool then let it in 100% and
could not get it to pull out to press
to a disk only pressed 1/2 way
keep it but feel it is not fit to the
press - come out OK
Give one coat of Varnish. Raked in 24 fold
then pulled - found that things were not
engaged out about 1/2 inch. Good felt found
stuck on one side. and had to get out
of mold

15103

150 No-100 dirt
28.8 ft. to 12
300 clay

Scrap is at
this mine is about
the same as the one
at the same place

104

No-98 Blank with one coat of
Varnish 27. Area 10 1/2 - 6 1/4
not Baked. dried in press

Printing mechanical

4 min. Temp. at 180

2 " High 750 lb. 180 deg. air heat 2"

10 " 750 lb. pressure at 180

Had to break down in 10 min. would
stuck bad

No-105-

No-98 Blank with 1 coat of
reg. Varnish - not Baked dried in
press

#106

No-99 Reluctant with 1 coat of
Varnish 2 1/2. from 10% - 4 - not Reluct
and in press

#107

No-99 Blank with 1 coat of Reg.
Varnish not Reluct and in
press

#108

#94 Blank 1 coat of 200 mesh
with 2 1/2 parts 10 1/2% not baked
cured in press

#109

#94 Blank 1 coat of 200 mesh
not baked - cured in press

110

10 + Blank

1 coat of Var 2% Para - 10% 6/4
not Baked Cured in press

and not Baked 100, 106, 107, 108, 109

110 Give away 134, 135, 136, 137, 138, 139

111

9: Blank

11-A Bannick

N₂ 3 Bake

Printing individual

4 min at 180°

2 " High 750 lb. 180°

10 " 75 lb. press at 250°

Stick with uniformity

0053

#113 - Rinkled & cracks in center
Fullouts - Printed Oct 7. Inspected Nov 13

#113

Prepared - got piece ^{at 124"} had 2 small fullouts

#113-B

to p. of 113-B

Bad fullouts Part of Blank for com.
with it Printed Inspected
Oct 14 Nov 13

113-A Rinkled - Record cracked

Printed

Oct 9

Inspected.

Nov-13

#112

1309 No 100 print
288 block
500 clay

#113

259 Wilsonite 37%

2 block

6 - 10.6% 64th

349 clay 57

1 coat of Reg Varnish - Reg Bake - 24 Std

Printed Reg

113-A

Top of 113 Egypt 2 coats of Varnish

Printed Reg 115 lbs steam 220°F

Blank Prepared out between models about 2" on
one side - Extracted from model frame

Slightly Rinkled - Prod P. O

#115 Printed
Oct 7

Imprinted
Nov 13

#115 Rinkled - Pullouts - 3 cracks
Center + Printed Oct 9 - Imprinted Nov 3

#115B Rinkled Pullouts -

#115-B

Run of 115-A Except High pressure
when printing was 400 lb - Squirt out
just as much as 800 lb pressure
not as good a print as No-115-A.
Bad pullouts on both sides

115-A Rinkled - 3 cracks in center
Printed
Oct 9.

Imprinted
Nov 13

#114

2 Blanks No-101 with 1 coat of Reg
Varnish - Baked in 24 Bld

#115

4 No 101 Blanks with 2 coats of
Reg Varnish - Baked in 24 Bld

Printing scheduled

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

2000 - 2000 - 2000 - 2000 - 2000

116

270 Gilsonite $\frac{1}{3}$ distilled $\frac{4}{5}$ = 38.8%
42 g flock $\frac{6}{10}$
378 clay $\frac{54}{100}$

to dry

117

300 Gilsonite $\frac{1}{3}$ distilled $\frac{4}{5}$ = 41.3%
42 flock
378 clay

Very stiff mix could not make a ball of
it put in press in about 4 lumps
pressed good except at one spot on outside
edge. Looks as if can't keep it hot enough
although hot as steam will make it

Pressed in got press at 126 °K

#118 Very Bodily Rinkled

Blank cracked 5 places

Printed	Inspected
Oct 9.	Nov 13

#119

Very Bodily rinkled

Record cracked 4 places

Printed	Inspected
Oct 7	Nov 13

#118

325 Gibsonite 1/3 distilled oil = 46.9%

42 flock = 6.1%

325 Clay = 46.9%

2 coats of Reg Varnish Varnished & Baked in 24 Bed

Surface looks granular after baking

Reg Printing scheduled 120 lbs steam

326° F. - Squirted out 2 inches - Very thin

Record cracked in 8 places - 4 places

Fine full print

#119

420 Gibsonite 1/3 distilled - 60%

70 flock = 10

210 clay = 30%

2 coats of Reg Varnish Baked Reg in 24 Bed

Surface looks granular after baking

Reg Printing scheduled 120 lbs steam

326° F. - Squirted out 2 inches - Very thin

Record cracked for places

Fine full print

120

Very Badly wrinkled
Record cracked & places
Printed Inspected
Oct. 9 Nov. 13

No. 121

Ripples all over not cracked
Printed Inspected
Oct 14 Nov 13

(Oct. 9-14)

#

120

490 Gilsonite 1/8 distilled 70%
105 Cotton flock 15"
105 clay 15"
Weight of Blank 325g
2 Coats of Reg Varnish Reg Boke in 24 Bld
Reg. Printing scheduled 120 lb steam 326°F
Squir out 2 inches between molds - very thin
Cracked
Fine full print



No. 121

260 Gilsonite 35.3
75 flock 10% - 22.3% to the Gilsonite
400 clay 54.4
2 coats Reg Varnish + Reg Boke in 24 Bld
Reg. Printing scheduled 320°F
One pullout in center of Record
OK print

2085

#

122

Ripples all over not cracked
 Printed Inspected
 Oct 14 Nov 13

123 Ripples all over not cracked
 Inspected Printed
 Nov 13 Oct 14

#122

266 Gilsonite - 33.5%
 115 flock 14.9% 30.7% to the Gilsonite
 400 clay 51.6%

mix stiff won't stand any more flock
 2 coats Reg Varnish + Reg Paper in 24 Bed
 no pullouts - Reg Printing scheduled
 flowed $1\frac{1}{2}$ inches when printed
 O/K print

#123

266 Gilsonite 36.8%
 145 flock 20.5% = 35.8% to the Gilsonite
 300 clay 42.5%
 2 coats Reg Varnish + Paper in 24 Bed
 Reg Printing scheduled - 12 min
 no pullouts - flowed $1\frac{1}{2}$ inches when pressed
 O/K print

124

Rumpled all over not cracked
 Printed Inspected
 Oct 14 Nov 13

#

124

260 Silsonite 34.8%

185 Flock 24.8% = 41% to the Silsonite

300 clay 40.1%

Very stiff. Won't stand any more flock
 or clay - Temp of press to press blank 137°F

2 coats Reg Varnish

Reg Bake 24 Bd -

" Printing scheduled 12 min

No pullout - flowed about 1/2 when pressed

OK print

#125

259 Coal tar 1/4 distilled 37%

42 flock 6% - 10.6% to the tar

399 clay - 57%

To dry

126

300 Coal tar $\frac{1}{4}$ distilled off
352 clay
to much clay... made it do
not enough to make a...
Cracked in 3 pieces drilling water hole

127

600 Coal tar $\frac{1}{4}$ distilled
600 Clay
all the clay if will stand
Cracked in three pieces drilling center
hole

#128

Scarcely any Ripples
Blacks cracked
Printed Inspected
Oct 16 Nov 13

129

no Ripples Cracked several
places
Printed Inspected
Oct 16 Nov 13

#128

600 Coal tar $\frac{1}{4}$ distilled 80.1%
150 Flack. — 20%
2 Coats of Reg Varnish + Reg. Bake in 24 Bed.
Reg Printing scheduled - 324° F
Full print. Flowed out between molds 2 inches
Cracked in four places

#129

600 Coal tar $\frac{1}{4}$ distilled 59.1%
100 flack — 9.8%
315 clay 31
2 Coats Reg. Varnish + Bake in 24 Bed
Reg Printing scheduled - 324° F
Full print. Flowed between molds 2 inches
Full fl crack - not Varnish record

#130

No Ripples Blank crasped
Painted Inspected
Oct 16 Nov 13

#131

Badly Rimpiled - Pullout Box
Printed Inspected
Oct 16 Nov 13

#130

600 Coal tar $\frac{1}{2}$ distilled
65 flock — 5.9%
450 clay
2 coats Reg Varnish + Baked in 2 + Bld
Reg Printing schedule 320° F
Full print flowed about 1 inch between
~~photo~~ molds
Record full of cracks

#131

250 Gilsonite — 33.3%
100 Wood flower 13.3%
400 clay 53.3
2 Coats Reg Varnish + Baked in 24 Bld.
Reg Printing schedule — 320° F
Full print flowed about $1\frac{1}{2}$ inches between
molds

#132

Body Rinkled - small P.O.
small crack on margin

Printed
Oct 18

Inspected
Nov 13

133

Body Rinkled. No cracked
Printed
Oct 18

Inspected
Nov 13

Oct 16-18

#132

250 Silsonite 35.7%
200 Wood flour 28.5%
250 Clay 35.7%

2 Coats of Reg. & Reg. Bkpn - 2 + 1 Bl
full print flowed 1 1/2 inches when
printed
Reg Printing scheduled 3 20°

#133


250 Silsonite 30.3%
50 Wood flour 6.1%
525 Clay 63.5%
2 Coats Reg. Bkpn + Reg. Bkpn - 2 + 1 Bl
full print flowed 1 1/2 inches when printed
Reg Printing scheduled 3 20°

[ITEM(S) FOUND IN BOOK]

Schedule # 2

1	Hour to reach	110° Lake
1	" "	120° "
1	" "	125° "
1½	" "	130
2	" "	140

Hold at 140 for 8 hours



[ITEM(S) FOUND IN BOOK]

175	35%
30	6%
275	57%
500	

155	31%
30	6%
375	63%
500	

[ITEM(S) FOUND IN BOOK]

	% Gilsonite to the total mix	% Flock to the total mix	% Flock to the Gilsonite	% Clay to the total mix
No-113.	37% —	6% —	10.6% —	57%
"-121-	35% —	10% —	22.3% —	54.4%
"-122-	33.5% —	14.9% —	30.7% —	51.6%
"-123-	36.% —	20.5% —	35.8% —	42.%
"-124-	34.8% —	24.8% —	41.% —	40.

Notebook Series -- Notebooks by Experimenters Other Than Edison
Phonograph Record Experiments
C. T. Dally Disc Blanks Composition Book 5
Notebook, N-19-06-03

This notebook was used by Charles T. Dally and one unidentified assistant, primarily during June-October 1919. Each experiment involves a different preparation of ingredients for the disc record blanks. Varnish preparations and baking schedules also vary. The blanks were prepared in 1919 and then inspected in 1920, 1921, and 1923. There is also a series of tests on clay. Inserted into the book is a 6-page list by Edison of projects for Dally, some of which correspond to the experiments in the book. The front cover is labeled "Exp on Blanks 5." The pages are unnumbered. Approximately 130 pages have been used.

Only the list by Edison has been selected.

[ITEM(S) FOUND IN BOOK]

Daily May 14/19

Determine & record
carefully the following

1st Blow & form the Resurced
in large pots holding from
50 to 100 lbs. - & take samples
out at times when you
think best so as to find
out from these samples
the best & shortest time
of Glacering. The best
temperature ~~also~~ so when
we get up we will
know just how to get
the best results.
Before you start on

[ITEM(S) FOUND IN BOOK]

2

large pot you should
find out by Experiment
with present small
pot what amount of
Lead, Manganese or
other stuff is best or if
its needed at all & the
best temperature.
Then you can go to the
big pot more intelligently

2nd find out the minimum
time of grinding, which
with best stirring will
produce 100% production
of best surface

[ITEM(S) FOUND IN BOOK]

3

2nd Continued -

Determine beginning
Records the minimum
amount of dampblack
that will do the work,
also if the dampblack
hurts the flowing or
hits the surface

3rd As an Experiment
Make some records

1 turned down to less
diameters one $\frac{3}{32}$ -

1 $\frac{1}{8}$ one $\frac{1}{32}$ one $\frac{3}{16}$

1 $\frac{1}{4}$ 1 $\frac{3}{8}$ + 1 $\frac{1}{2}$

[ITEM(S) FOUND IN BOOK]

4

3rd

This will show us just
what Margin we have
The resultant records
should be recorded in
book marked for defects
apart away for time
to see if recent
stratification of Greenwich
will produce cracks

At the 3 Regular Records
1 hour of undisturbed should
be put in the ice chest
& dated, see no water
can get on them

[ITEM(S) FOUND IN BOOK]

5

5th Minimum time to get
good mixing in mixer should
be ascertained also
best temperatures to have
the Room Oil mix when
poured in also if heating
the Chalk to same temperature
or higher than the mixer
before its put in will
shorten the mixer time
also if circulating hot
air through mixer will
shorten time the air being
heated to same or higher
than the oil use thermometer as
far as possible & record temp.

[ITEM(S) FOUND IN BOOK]

6

6th = print a few records
I would soon if no more
in find (the record) where
Taps don't touch blank
to see if it is OK & no bugs
are found -

7 = also best type & method of
screening & to get properly
account of % of records
etc & all data -

8 Best device for automatic
loading of records 2

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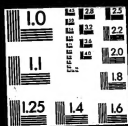


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